

The Changing Farm Sector and Future Public Policy: An Economic Perspective

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Even though the functioning of the farm sector is closely monitored, its behavior carefully studied, and each component detailed in an array of statistics, our understanding and perception of the state of agriculture frequently needs updating. The expiration in 1981 of the omnibus Food and Agriculture Act of 1977 makes this a fortuitous occasion to examine the farm sector as it exists today, the milieu in which farm economic problems develop, and the nature of the problems that should be the object of public policy.

This paper develops a perspective on the farm sector that is current and relevant to the formulation of public farm policies. Since present and future policies are so importantly conditioned by the past, the paper begins with a brief retrospective view. That review examines the persistent 'farm problem'—the chronically low earnings that arose from extensive disequilibrium, provided the rationale for farm policy for over 50 years, and indeed, remains the underlying premise for much of that policy today.

The second section examines the events of the seventies, now widely viewed as a time of transition for the agriculture sector. The third section examines likely future global food production and consumption, a major determinant of the economic environment for agriculture during the eighties. The next section contains a profile of the farm sector today, focusing on those characteristics deemed most important to future policy development. From this profile, the nature of today's economic problems for major groups of farms are examined and, for the primary producers, seen to be in sharp contrast to the problems that long prevailed.

The final section summarizes the perspective developed in the paper. It draws implications relevant for structuring policy for a new and unfamiliar era in American agriculture.

A Retrospective View

After many years of study and rhetoric, a consensus has finally evolved on the nature and causes of the chronic and

major economic ill that had come to be referred to as the farm problem. It is now known to have been a severe resource maladjustment in the Nation's farm sector; that is, too many resources were devoted to farming. The amount of food needed could have been produced by far fewer farmers, and technological improvements (in machinery and crop strains, for example) kept reducing further the number of farmers that could meet the food demand. As a result, many farmers were poorly paid for their production and abandoned farming.

The Historical Farm Problem

The farm problem can be traced to the transformation of this country from one that was primarily agrarian to one that is primarily industrial. The Nation was still largely rural through the beginning of the 20th century, with a high portion of the population engaged in agriculture. Immediately following World War I, technological advances in the form of machines and improved farming methods transformed farming into a highly competitive sector necessitating that farmers adopt the newly emerging technology or be quickly placed at a disadvantage to others who did so. The demand for farm products expanded much more slowly than the capability to produce them due to their low income elasticity (as consumer incomes rose, the increases in food expenditures were much less than proportional). These conditions caused the supply of farm products to grow persistently at a rate faster than the growth in demand. The result was "disequilibrium"—too many resources, especially labor, devoted to food and fiber production. The disequilibrium manifested itself in underemployment and low returns for agricultural labor and low commodity prices.

The problem was succinctly characterized as follows:

... the labor and capital employed in the industry cannot all continue to earn, by producing goods for sale in a free market, as much income as they formerly earned, or as much as they could earn in some other use; that is—the industry is using too many resources. (2)¹

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¹ Italicized numbers in parentheses refer to items in the References section at the end of this article.

The problem was chronic as the excess labor flowed slowly out of agriculture. The costs of movement, lack of training, lack of knowledge about, and, in some periods, too few nonfarm job opportunities, and other obstacles kept the outmovement slow.

Brandow noted that:

Farm problems got on the Nation's policy agenda because dissatisfied farmers put them there. Dissatisfaction became widespread during the price collapse of 1920-21 and was sufficiently strong throughout the 1920's to engender much legislative activity culminating in the Federal Farm Board of 1929. Extreme distress on farms in the early 1930's was part of the Nation's economic and social conditions to which the New Deal was a response. Extensive Federal farm programs were firmly established by the end of the 1930's. (9)

The same fundamental rationale for those farm programs has been maintained over the 50 years they have existed: farmers as a group have been economically disadvantaged by the stream of new technology that led to continued production increases, often far exceeding needs, making it possible for fewer and fewer farmers to supply the food and fiber needs of larger and larger numbers of people. That technology, financed in part by large public outlays, was deemed of great benefit to the American public; the public via the Congress thus acquiesced in helping to bear the adjustment burden through subsidies to the farm sector.

The implicit goal of the farm programs was thus the redistribution of incomes—the transfer of income from consumers and taxpayers to farmers whose incomes were significantly below the incomes of the rest of the population. The public subsidies were thus attempts to redress an economic inequity by helping to bring the incomes of farm people closer to the nonfarm average. This has not always been the sole objective (nor perhaps even unanimously agreed upon when stated in this way) and the emphasis has changed slightly from time to time as acute problems arose. Moreover, this compensation principle in earlier years may at times have been confused with a goal of alleviating poverty. However, it was eventually recognized that addressing poverty in agriculture through farm programs was grossly inefficient because of the basic structure of the programs.

A basic tenet of the farm programs since their inception has been to provide benefits to farms according to their volume of production: the greater the volume of output, the greater the benefits received. However, for a goal of alleviating poverty, this basic tenet would mean that the programs were grossly inefficient since most of the program benefits go chiefly to the larger farms whose incomes were well above any reasonable poverty criterion (1).

The Evolution of Farm Policies

The farm problem, surfacing soon after World War I, became enmeshed with the effects of the worldwide depression in the early thirties. This confounded any diagnosis, and consensus on its seminal causes did not emerge until much later.² The early policies and programs had elements of both the circumstances of the depression and the more immediate circumstances of agriculture. From initially treating the most apparent symptoms, the policies subsequently evolved over the next four decades in response to a growing understanding of the chronic nature of the farm problem and to changing economic circumstances.

The policies initially embarked on supporting commodity prices above market-clearing levels; that is, above levels that would have prevailed without Government intervention. However, while perhaps immediately beneficial, the programs had unintended adverse effects. Farmers responded to the higher price supports by producing even more; at the same time, the higher supports (prices) discouraged consumption (industry even sought to develop substitutes, such as margarine and synthetic fibers), and the problem perhaps became even more severe. It soon became obvious that, if the price support system were to succeed, production would have to be controlled.

The next step, then, was to constrain the production of the crops in excess supply. Rigid supply controls—marketing quotas, acreage allotments, and other measures—were applied to the crops being produced in overabundance. But with no coordination across the various commodities, farmers restricted in producing one crop turned to another, and supply-demand imbalances arose in other commodities. Also, newer output increasing technology appeared and was rapidly adopted, causing a continuation of production in excess of effective demand. There were side effects from the production controls as well. The allotments fixed production or resource use patterns and that rigidity prevented the adjustment of resources as changing conditions warranted, thus contributing to a misallocation of resources in the economy.

The farm problem persisted, interrupted only during war, and the programs continued, largely unchanged, until the sixties. By then, large stocks of surplus grains, cotton, and dairy products had accumulated under Government ownership, the competitiveness of U.S. farm products in world markets had been impaired by the high price supports, and the Treasury costs of the programs had become large and

²In a review of the post-World War II agricultural economic policy literature, Brandow ascribes the first comprehensive description of the farm problem to T. W. Schultz in his 1945 book, *Agriculture in an Unstable Economy* (9).

politically unsustainable.³ More economically rational policies were then introduced. Perhaps the most important of the policy modifications was a shift in the means for supporting farm incomes—away from sole reliance on price supports to making direct payments (so-called price support payments) for some commodities. This enabled the price supports to be lowered, reducing their interference with the markets, and the direct payments were then used to supplement farm incomes. This was the start toward the eventual separation in 1973 of commodity price support from income support and the use of different programs to pursue the objectives independently.

The successful features of the farm policies that had evolved over the years were incorporated into the Food and Agriculture Act of 1965. The act marked the start of a return to reliance on the market as the allocator of resources and products by reducing the interference of price supports with this function, by increasing reliance on direct payments to enhance incomes, and by embracing more voluntarism in the supply management schemes.

This was followed by the Agriculture Act of 1970. Dubbed the “consensus bill” even though not specifically embraced by any major farm organization or political party, it brought further changes in the traditional policy tools. The individual commodity approach to production control (for the major commodities) was discarded in favor of restraining the total capacity of the agricultural production plant. To be eligible for program benefits, farmers had only to idle a specific proportion of their cropland. Except for quota crops (rice, sugar, peanuts, tobacco, and extra long staple cotton), farmers were then free to plant whatever they deemed to be to their economic advantage on the remaining acres. The direct payments feature for feed grains, cotton, and wheat was continued.

The 1970 Act also limited, for the first time, the amount of payments an individual farmer could receive. It proved to be more symbolic than effective, however: a \$55,000 limit was applied to the cotton, wheat, and feed grain programs separately and it excluded CCC price-support loan proceeds.

The next major agricultural legislation, the Agriculture and Consumer Protection Act of 1973, continued the movement toward fewer program restrictions and greater reliance on market signals to guide producer decisionmaking. It incorporated a commodity target price/income deficiency payment system for the major crops, fully separating income support from price support. This scheme, patterned after a

concept first proposed in the late forties, provided for varying the income support to producers inversely with the market price.⁴ No payments are made if the market price is at or above the target price. If the market price falls below the target price, the payments are based on the differential. (The concept is more fully described in (14).)

The Congress, in its continuing search for a workable criterion for determining farmers’ economic welfare, also adopted a “cost of production” concept as the basis for annual adjustment of the target prices in the 1973 Act. This also marked the formal end of the use of calculated parity prices in setting support rates for such commodities as the food and feed grains and upland cotton. Parity prices, however, continued to be used for other commodities such as milk and tobacco. (For a concise history of the parity concept and discussion of the limitations of calculated parity prices, see (10).) The lack of adequate cost data at that time forced the use of a broad-based index of prices paid for agricultural inputs, but, by congressional directive, individual commodity cost estimates were developed after 1973. The payment limit was reduced to \$20,000, and made more stringent by applying to each producer and to the cumulative amount received from all programs (except CCC loans).

The 1973 Act was developed in an environment quite different from that prevailing when previous farm bills had been developed. Rather than evolving from an overriding concern with chronic surplus production, the 1973 bill came at a time of considerable uncertainty. The first of the Russian grain sales had occurred, and global demand for U.S. agricultural products had increased abruptly, forcing prices sharply higher. Whether this global demand was permanent or atypical was unknown at the time. However, commodity prices subsequently remained above the target prices and the program provisions were generally not used during the life of the act.

The current embodiment of broad farm policy is the Food and Agriculture Act of 1977. This act further modified and extended the policy tools. It provided for flexible price support levels (allowing them to be reduced if they interfered with competitiveness in export markets). The act increased reliance on cost-of-production, determined direct payments for income support (linking target price determinations to

³ Dairy products, not being storable for long periods, were distributed to needy consumers both domestically (welfare food distributions and school lunch programs) and internationally (Public Law 480).

⁴ When proposed by Secretary of Agriculture Charles Brannan in 1949, the plan was a radical departure from existing programs. The Brannan Plan incorporated an income standard based on a moving average of income over the past 10 years. Price support standards were to be set for individual commodities as necessary to achieve the target income standard. Commodities would be sold at prices that would clear the market and any difference between the standard and the market price received would be provided through direct payments. The amount of a commodity eligible for the direct payment was restricted and production above this amount had to be sold at the market price, thus serving to restrain production.

commodity-specific costs rather than the broad index of prices paid), abolished the rigid acreage allotments (substituting a current plantings concept, precluding program-induced rigidities), and, for the first time ever, embraced a formal grain reserve. It is this legislation, expiring in 1981, that must be extended by the 97th Congress.

Basic Tenets of the Farm Programs

The changes in farm policy over the years have usually followed events rather than determined them. Policy evolution has also shown a remarkable degree of continuity, in fact, much more continuity than change. Many of the mechanisms (the policy instruments) that were put in place very early survive today.

Policymakers, viewing the income problems of farmers, initially adopted mechanisms that were price increasing, assuming that higher prices meant higher incomes. These mechanisms continue to emphasize commodity price enhancement, although perhaps not as overtly for the major commodities. (Dairy, of course, is an exception to this.) Even the grain reserve formed in 1977 was largely motivated by an objective of raising grain prices. Thus, a major tenet of the programs from the beginning to today is the use of commodity price-enhancing mechanisms. But, over time the distribution question—which groups of farmers are receiving the higher incomes from the higher prices and at what cost to taxpayers and consumers—has become much more important, but never adequately treated in policy and program formulations.

Another basic tenet of the programs, maintained from their inception to date, is the provision of benefits to farmers based on volume of production. Quite simply, this means the larger the quantity of commodities produced, the more subsidies a farmer receives. When the programs were initiated in the early thirties, farm numbers were near their peak of almost seven million and the benefits were perhaps more equally distributed among all farms. As farm numbers have declined over time and the average size correspondingly increased, the fewer large farms with greater volume have tended to receive a much higher proportion of the total program benefits than have the more numerous smaller volume farmers. This skewed distribution of benefits among farmers has long been known and thoroughly documented in studies by Bonnen, Schultze, and Lin, Johnson, and Calvin (1, 18, 8).

Another enduring tenet is the use of national averages in developing program parameters applicable across the entire farm sector. The commodity target prices are based on national averages of crop production costs for all farms regardless of size, location, and circumstances. The nonrecourse loan rates are likewise national averages. The use of national averages implicitly assumes a homogeneous agricul-

tural sector populated with similar farms producing the program crops, a very dubious assumption now, although perhaps less so when adopted in the thirties. The effects of using national averages—windfall gains to some producers and too little benefits to be meaningful to others—may have contributed to distortions in resource use and may have been an important factor in the changing farm sector structure. (Some implications of this are illustrated in the paper by O'Brien elsewhere in this issue.)

Agriculture in Transition—The Seventies

Even though the farm programs were being made more economically rational in the mid-sixties, the lingering symptoms of the farm problem were perhaps most pronounced at the turn of the decade. Stocks of surplus grain under Government ownership were huge, program costs high, and a large amount of the cropland idled by Government programs. But, global and domestic forces, some long in the making and which had gone largely unnoticed, were converging to alter that situation. In the world economy, a much closer balance between the demand and supply for the output of America's farms was gradually evolving. Rapid growth in global population and incomes, together with a heightened sensitivity to hunger and malnutrition, were leading to increased demands for U.S. agricultural output. Further, the concurrent shift of some centrally planned economy countries from being net food exporters to net importers worked to the same effect. Meanwhile, however, the supply of U.S. farm output was rising less rapidly; the rates of crop yield increases in the very early seventies were slowing from the impressive gains of the sixties.

Several unique events in the early seventies caused an abrupt change in the supply-demand balance for food. Foreign exchange rates were first realigned in 1971 (increasing the competitiveness of U.S. products in foreign markets), wage and price controls were imposed on the domestic economy, adverse weather brought poor harvests to parts of the world, and some major countries (particularly the Soviet Union) changed their policies toward responding to food shortages.

This convergence of long-term forces coincided with the more abrupt events of 1972. Russian entry into our grain market was first revealed in mid-1972, beginning a tumultuous period for U.S. agriculture, which perhaps stripped away trappings to reveal developments of even greater significance over the long run.

Parts of the agricultural sector enjoyed nearly unparalleled prosperity during 1973-75; record volumes of exports pushed crop commodity prices to record-high levels while farmers' production costs lagged considerably, significantly increasing profit margins. Real net farm income for the sector in 1973 reached its highest level since World War II. Although down

sharply in 1974 and 1975, farm incomes remained well above the average of the previous decade.

But this economic boom for parts of the farm sector was not without its undesirable side effects. Expectations of permanent prosperity were created in the farm community. Many young people entered farming during this period; many existing farmers expanded their capital investment in land and machinery; and land prices were bid up substantially. Both groups contracted large debt at the inflated asset prices—based on expectations for what subsequently proved to be unsustainable conditions.

Domestic food prices also increased sharply during this period. Consumer food expenditures rose by over \$50 billion, and low-income consumers were affected severely. Domestic inflationary pressures were exacerbated, leading to commodity export embargoes that strained relations with many of our longstanding trading partners.

While crop farmers prospered, the livestock farmers were buffeted by the volatile grain markets and forced into one of their most unprofitable periods. These conditions subsequently precipitated the sharpest liquidation of the cattle herd in history, the ramifications of which are still present today.

Fundamental changes in the farm sector had been occurring before the seventies; but these, too, went largely unnoticed, undoubtedly obscured by conditions that had come to characterize agriculture. Ironically, in the year of the initial disruption (1972), 62 million acres, nearly one-fifth of the Nation's cropland (and the second largest acreage ever), were idled by programs. Grain prices had remained depressed because of the overhang of surplus stocks on the market. These conditions no doubt masked the more fundamental changes that were bringing supply conditions into closer accord with demand.

It is now rather widely accepted that the resource disequilibrium long plaguing the farm sector was passing around the beginning of the seventies, but remaining vestiges of the farm problem obscured the change. One of the early persuasive arguments of this view was advanced by D. Gale Johnson in a monograph appearing in late 1972 (4). Johnson later argued:

... that most of the resources that had been retained in U.S. agriculture during the early 1950's and early 1960's had been eliminated, primarily through adjustments in the labor market and the significant abandonment of farm land. The labor market adjustment prior to 1950 had occurred primarily through migration away from farms but starting in the 1950's part-time nonfarm employment played an increasing role in labor adjustments in agriculture. In 1960, the first year for which we have data, 42 percent of the in-

come of farm operator families came from off-farm sources; by 1970 the percentage had increased to 55 and in 1976 and 1977 to 62 percent. In large part as a result of the reduction in the number of farm workers and the increase in off-farm income, the per capita disposable income of farm relative to non-farm people increased from less than 50 percent in the latter part of the 1950's to about 75 percent in 1970 and 1971. Given the characteristics of the data and the fact that capital gains are not included in the income data, farm per capita disposable income that is 75 to 80 percent of non-farm is probably not far from an equilibrium level. By equilibrium level I mean one which provides approximately the same return to farm resources, both labor and land, as is received by comparable nonfarm resources. (5)

In 1976, Schuh reinforced Johnson's argument citing the significant changes that occurred in the economic environment of agriculture in the early seventies—reduced labor outmigration from agriculture, stagnating productivity growth, the shift to floating exchange rates, and changes in the international economic environment. Drawing one of the implications of this combination of changes, he stated:

The secular income problem in agriculture is now largely behind us. The emerging equilibrium in the labor market is of major significance in this respect. When this equilibrium is combined with the decline in the rate of productivity growth, the release of most of the idled land back to production, and the shift to the right in the demand for agricultural products as a result of devaluation, the result is an almost total disappearance of the excess capacity that existed at prevailing price ratios for such a long period of time. (17)

The subsequent evidence—the slowed net labor outmigration from the farm sector, the emerging equality of the per capita incomes of farm and nonfarm people, the essentially full utilization of the readily available cropland, and the continued strong demand for U.S. products in foreign markets—strongly supports an assertion that the farm sector is now in near equilibrium and perhaps has been so for several years.

This does not in any way, however, imply that a static state has been reached, that there will not again be times of supply-demand imbalances resembling former periods. There may well be, but these will likely be transitory, most likely arising from brief periods of favorable global weather conditions, rather than reflecting any chronic imbalance as in previous decades.

Resource equilibrium, combined with the likely future economic environment (treated in the next section), has signifi-

cant implications for the domestic farm sector and the structure of policies appropriate for that future.

The Prospective Economic Environment: The Eighties

The previous discussion has suggested that the long period of chronic overproduction, burdensome surpluses, and low farm incomes may have passed, and that there appears to be little shortrun slack in the production sector at present. While this development alone is significant enough, the implications become even more significant when considered in the context of the likely economic environment for agriculture in the eighties.

Most agricultural previews of the eighties are in general accord that the global food production and consumption balance will become even more tenuous, marked by increasingly smaller margins, greater annual variability, increased total trade, and greater demand for U.S. exports. A detailed analysis by O'Brien, in the previous article of this issue, contains findings that, if realized, will have tremendous implications for U.S. agriculture:

- The global demand for agricultural products could expand at or near record rates annually during the eighties, despite some slowing in population growth rates and generally sluggish economic activity, especially slower growth in the developed countries.
- The growth in global food production in the eighties may slow to about three-fourths of the historical rate. And, even this rate of growth will come only at substantially higher costs and from sources different from the past. Further production increases from the relatively inexpensive expanded use of arable area are likely to be significantly smaller than at any time over the last three decades. The expansion that does occur will be onto more marginal (fragile) lands, further exacerbating annual fluctuations in production. Accelerating productivity growth will thus become an even more important source of output increases. However, to the extent that productivity increases depend on augmenting land with energy intensive inputs, those increases will be more expensive in the future and thus unlikely unless commodity prices are higher.
- Few countries would have been able to support the gains in food consumption reported in the last three decades through increases in indigenous production alone. The gains were made possible by world trade, growing at more than twice the rate of production and consumption.

- Global supply/demand prospects suggest that the world will depend increasingly on supplies from the United States, and that increases of 7 to 9 percent per year in U.S. exports may be necessary to meet that demand. The growth in U.S. export demand will be strongest for feed-stuffs (coarse grains and oilseeds), with less growth for food grains (wheat and rice).
- Growth in demand for U.S. products will become significantly more variable from year to year; the increasingly dominant U.S. role as a world food supplier means that swings in production and consumption virtually anywhere in the world will translate into amplified fluctuations in demand for U.S. products and greater market instability.
- The growth in domestic demand for agricultural products is expected to average between 0.8 to 1.1 percent annually, compared with 1.2 percent during the seventies. However, the future rate could surpass the historical rate should unconventional sources of demand, notably agricultural products for fuel and industrial uses, become more feasible.
- Overall, total demand (domestic and world) for U.S. agricultural products could grow by as much as 3 to 3.2 percent per year on the average, yet fluctuate as widely as 10 to 15 percent per year. Meeting this growth in demand would entail expanding U.S. production between one and one and one-half times the average rate of the post-World War II period.
- Real prices received by farmers could increase an average of 1 to 3 percent per year, in sharp contrast to the 1- to 2-percent annual average decline since World War II.

A world remaining relatively peaceful and modestly prosperous will almost certainly generate continued strong growth in U.S. agricultural exports, especially coarse grains and oilseeds. Additionally, farmers will probably see real price increases for these products, signaling the need for even more production.

The emphasis of food and agricultural policy and the day-to-day concerns of policy officials charged with managing policy could well be the opposite of past decades. Rather than being faced with overproduction and surpluses, those charged with supply management will more likely confront shortages and respond by encouraging production. The policy concerns will likely become much broader and involve questions significantly different from those traditionally treated.

One question that would emerge from the O'Brien scenario (see previous article) is the nature of the supply function for

land. If the function turns up sharply, this means higher product prices and higher food prices. It also implies windfall profits for owners of productive land, profits that can be used to outcompete others for land and thus contribute to further concentration of landownership and production.

Further, conservation will become even more critical. As the increase in real prices encourages the expansion of production onto more fragile lands, environmental degradation may be greater, implying a loss in future production capacity.

This would raise the issue of whether we are exporting our natural resources, of whether market prices are really reflective of all incurred social costs (loss of topsoil, environmental degradation, subsidized water, subsidized transportation). The impacts of the intensifying competition for land between export crops and other lower return crops (such as forage) will work themselves through the food system and will show up in the cattle cycle, supplies of beef, retail food prices, and related issues. Inevitably, the tradeoffs among domestic food, natural resource, and trade policies would come to the forefront.

A Profile of the Farm Sector

This section, in profiling the farm sector—its land, people, and productivity—and examining the farms in some detail, shows just how much farming has changed in the past decade.

Land in Farms

The total land area in farms has changed relatively little in the 20th century (table 1). Land development was still being encouraged early in the century (the 1902 Reclamation Law, for example) and nearly 150 million acres were added to farms in the next three decades. Land in farms continued to increase slightly until 1950, then declined steadily until 1978.

Land in farms is used for crops, pasture, fallow, forests, lots, and the farmstead. Total land used for crops was greatest just after World War II and was least in the late sixties and early seventies when large acreages were idled by Government programs (table 2). Land used for crops in 1979 was the same as in 1929, yet, many of the current crop acres are significantly more productive, owing to improvement in irrigation, drainage, forming conservation practices, and other measures. The total cropland base (excluding pasture land) is slightly larger than the total used for crops in any one year, suggesting that some additional acreage (undoubtedly of lower quality) may be available for cropping if economic conditions warrant.

While there is general agreement that some relatively small additional acreage exists, which could be brought into pro-

Table 1—Land in farms, 1900-78

| Year | Land in farms ¹ | Change |
|------|----------------------------|----------------|
| | <i>Million acres</i> | <i>Percent</i> |
| 1900 | 839 | |
| 1910 | 879 | +4.8 |
| 1920 | 956 | +8.8 |
| 1930 | 987 | +3.2 |
| 1940 | 1,061 | +7.5 |
| 1950 | 1,159 | +9.2 |
| 1954 | 1,158 | 0 |
| 1959 | 1,120 | -3.3 |
| 1965 | 1,110 | -.9 |
| 1969 | 1,062 | -4.3 |
| 1974 | 1,017 | -4.2 |
| 1978 | 1,031 | +1.4 |

¹ The data are not adjusted for changes over time in methodology or definitions.

Sources: *Economic Tables*, U.S. Dept. Agr., Econ. Res. Serv., June 1975, and Census of Agriculture, 1978.

duction rather quickly, there is much less agreement on the quantity that could eventually be used for crops. The estimates range from a few to several million acres of varying capabilities. However, it is clear that the larger the amount, the greater the investment required to make that land suitable for sustained production. This investment, of course, will occur only when economically feasible—when the expected future stream of real returns to agricultural production justifies the commitment of capital to this particular use. Greater public awareness of the fragility of the entire natural resource base and its interrelation with the quality of the environment has made future production capacity of American agriculture a much more immediate issue than it was a decade ago.

Other issues, somewhat separate from capacity, surround the Nation's resources and the use of those resources. One such issue is the ownership and control of the land and the effects of emerging landownership patterns on agriculture. A recent landownership survey revealed how highly concentrated is ownership of farmland (table 3). One percent of the landowners own 30 percent and 5 percent own 48 percent of the farmland.

How farmland ownership is distributed is important in developing agricultural policy, particularly when one considers that many of the benefits of past farm programs have been capitalized into asset (primarily land) values, hence accruing to the owners of the land. Further, there is a growing trend

Table 2—Major uses of land, 1924-79

| Year | Cropland harvested | Crop failure | Fallow | Total used for crops | Idle | Pasture | Total cropland, excluding pasture | Acres idled by programs |
|----------------------|--------------------|--------------|--------|----------------------|------|---------|-----------------------------------|-------------------------|
| <i>Million acres</i> | | | | | | | | |
| 1924 | 346 | 13 | 6 | 365 | 26 | NA | 391 | 0 |
| 1929 | 356 | 13 | 10 | 379 | 34 | NA | 413 | 0 |
| 1934 | 296 | 64 | 15 | 375 | 40 | NA | 415 | 0 |
| 1939 | 321 | 21 | 21 | 363 | 36 | NA | 399 | 0 |
| 1944 | 353 | 10 | 16 | 379 | 24 | NA | 403 | 0 |
| 1949 | 352 | 9 | 26 | 387 | 22 | 69 | 409 | 0 |
| 1954 | 339 | 13 | 28 | 380 | 19 | NA | 399 | 0 |
| 1959 | 317 | 10 | 31 | 358 | 33 | 66 | 391 | 22 |
| 1964 | 292 | 6 | 37 | 335 | 52 | 57 | 387 | 55 |
| 1969 | 286 | 6 | 41 | 333 | 51 | 88 | 384 | 58 |
| 1972 | 289 | 7 | 38 | 334 | 51 | NA | 385 | 62 |
| 1973 | 316 | 5 | 31 | 352 | 32 | NA | 384 | 19 |
| 1974 | 322 | 8 | 31 | 361 | 21 | 83 | 382 | 3 |
| 1975 | 330 | 6 | 30 | 366 | NA | NA | NA | 2 |
| 1976 | 331 | 9 | 30 | 370 | NA | NA | NA | 2 |
| 1977 | 338 | 9 | 30 | 377 | NA | NA | NA | 0 |
| 1978 | 331 | 7 | 31 | 369 | NA | NA | NA | 18 |
| 1979 | 342 | 7 | 30 | 379 | NA | NA | NA | 12 |

NA = Not available.

Sources: Adapted from *Changes in Farm Production and Efficiency, 1978*, SB-628, U.S. Dept. Agr., Econ. Stat. Coop. Serv.; *Major Uses of Land in the United States, 1950*, TB-1082 (Supplement) September 1953, U.S. Dept. Agr., Bur. Agr. Econ. and published reports in the USDA land use series since 1950.

Table 3—Distribution of landownership and age of landowners (farmland), 1978

| Region | Proportion held by— | | Age | | | | |
|---------------------------|---------------------|-------------------|----------|-------|-------|-------|-------------|
| | Largest 5 percent | Largest 1 percent | Under 35 | 35-49 | 50-64 | 65-74 | 75 and over |
| <i>Percent of acreage</i> | | | | | | | |
| Northeast | 34.2 | 13.8 | 7.8 | 29.1 | 38.4 | 16.3 | 8.4 |
| Lake States | 24.2 | 8.4 | 9.6 | 31.3 | 36.0 | 15.2 | 7.9 |
| Corn Belt | 24.6 | 7.9 | 6.2 | 25.1 | 37.4 | 18.5 | 12.8 |
| Northern Plains | 32.7 | 14.9 | 6.4 | 24.0 | 39.9 | 19.5 | 10.2 |
| Appalachian | 39.1 | 17.0 | 6.5 | 24.1 | 37.5 | 20.5 | 11.4 |
| Southeast | 49.2 | 21.1 | 4.3 | 22.1 | 42.1 | 20.4 | 11.1 |
| Delta | 45.8 | 23.0 | 5.2 | 25.1 | 37.2 | 22.2 | 10.3 |
| Southern Plains | 53.6 | 33.4 | 4.7 | 20.1 | 39.6 | 21.3 | 14.3 |
| Mountain | 67.2 | 37.6 | 5.0 | 26.5 | 43.6 | 17.9 | 7.0 |
| Pacific | 71.0 | 43.0 | 4.3 | 23.1 | 42.4 | 18.2 | 12.0 |
| United States | 48.1 | 30.3 | 5.9 | 24.6 | 39.8 | 19.1 | 10.6 |

Source: 1978 Landownership Survey, U.S. Dept. Agr., Econ. Stat. Coop. Serv.

toward separation of ownership and operation of farms (nearly half the cropland is farmed by someone other than its owner).

The age of farmland owners—people 50 years old or more own almost 70 percent of the farmland—suggests large inter-generational transfers of land will occur in the coming two or three decades. How these transfers occur—whether through inheritance, open market sales, or sale to institutional buyers—will importantly affect the ownership of land, the organization of farming, and who the future farmers will be.

The Farm Population

The U.S. farm population numbered 32 million, 30 percent of the Nation's total population, when first separately enumerated in 1920 (fig. 1). It has declined almost continually since, generally corresponding to the decline in the number of farms. In 1979, the most recent year for which data are available, the number of persons living on farms was 6.2 million (table 4): Only 1 in 33 (about 3 percent) of the Nation's 220 million inhabitants resided on a farm. This esti-

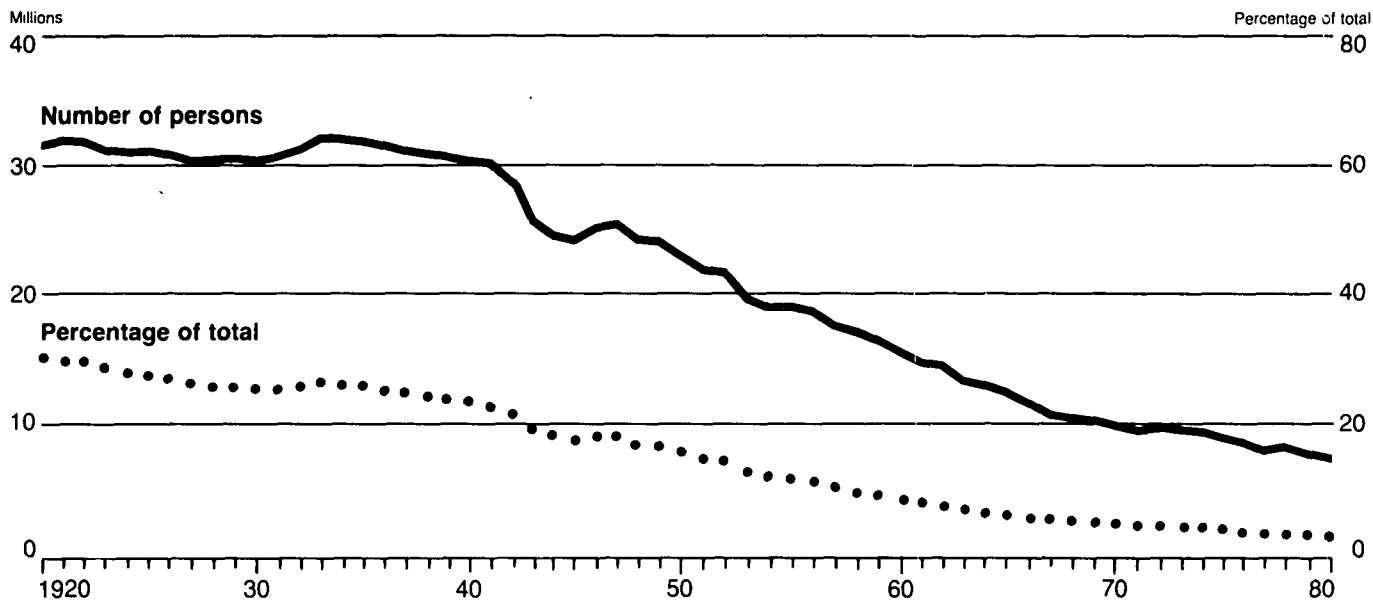
mate is based on the new definition of a farm (1978) in which the farm population consists of all persons living in rural territory on places with sales of agricultural products of \$1,000 or more per year.⁵

Total agricultural employment was unaffected by the definition change. The number of persons employed primarily in agriculture in 1979 was 3,297,000, now about equally divided between farm and nonfarm residents. However, persons self-employed in agriculture—farm operators—are mainly farm residents. Of the 1,642,000 self-employed agricultural workers, 1.1 million, or two-thirds, lived on farms. The rest lived in town or in open-country nonfarm homes. Agricultural laborers were more likely to live off the farm and commute to work. There were 1,413,000 agricultural wage and salary workers employed primarily in agriculture in 1979;

⁵ The estimate of the 1979 farm population based on the previous definition of a farm (rural areas or places of 10 acres or more with at least \$50 worth of agricultural sales per year or places of less than 10 acres with at least \$250 worth of sales per year) is 7.5 million. All persons reclassified as nonfarm under the new definition were on places with farm product sales under \$1,000.

Figure 1

Farm population



Source: U.S. Department of Agriculture and Department of Commerce.

only about a fourth of these lived on a farm.⁶ Most unpaid farm family workers, who numbered about 390,000, resided on farms.

Farm residence was once strongly associated with farm employment but this is no longer the case. Today, farm people are almost as likely to work in nonagricultural industries as

to work on the farm. Of the 3.3 million farm residents in the work force in 1978, 44 percent were not employed in agriculture. However, more farm females than males work in nonagricultural industries. In 1978, about 7 out of 10 employed farm females were engaged solely or primarily in non-agricultural pursuits; among farm resident males only 4 out of 10 were so employed.

⁶ Another widely quoted estimate (the Hired Farm Working Force Survey, 1979—no survey was conducted in 1978) of the hired farm labor work force is 2.7 million. This estimate is the total number of people who worked at least 1 day on a farm during 1979. The estimate of 1,413,000 is an average of quarterly estimates of people who list agricultural work as their primary occupation. Neither estimate accounts for undocumented aliens, variously estimated to number as high as 1 million workers.

This examination of the population characteristics of rural America and the farm sector leads to some summary observations.

- The total population of the country has almost doubled since 1920. But within this growth setting, the rural population has remained relatively constant in absolute num-

Table 4—Selected population characteristics, 1920-79

| Year | Total resident population ¹ | Rural population ² | Farm population ³ | Total agricultural employment ⁴ | Agricultural wage and salary workers ⁵ |
|----------------------|--|-------------------------------|------------------------------|--|---|
| <i>Thousands</i> | | | | | |
| Current definition: | | | | | |
| 1979 | 220,099 | 55,000 (est.) | 6,241 | 3,297 | 1,413 |
| 1978 | 218,228 | 55,000 (est.) | 6,501 | 3,342 | 1,418 |
| Previous definition: | | | | | |
| 1979 | 220,099 | 55,000 (est.) | 7,553 | 3,297 | 1,413 |
| 1978 | 218,228 | 55,000 (est.) | 8,005 | 3,342 | 1,418 |
| 1977 | 216,400 | NA | 7,806 | 3,244 | 1,330 |
| 1976 | 214,680 | NA | 8,253 | 3,297 | 1,318 |
| 1975 | 213,051 | NA | 8,864 | 3,380 | 1,280 |
| 1974 | 211,389 | NA | 9,264 | 3,492 | 1,349 |
| 1973 | 209,859 | NA | 9,472 | 3,452 | 1,254 |
| 1972 | 208,219 | NA | 9,610 | 3,452 | 1,216 |
| 1971 | 206,219 | NA | 9,425 | 3,387 | 1,161 |
| 1970 | 203,810 | 53,887 | 9,712 | 3,462 | 1,152 |
| 1960 | 179,323 | 54,054 | 15,635 | 5,458* | 1,762 |
| 1950 | 151,326 | 54,479 | 23,048 | 7,160 | 1,630 |
| 1940 | 132,166* | 57,459 | 30,547 | NA | NA |
| 1930 | 122,755 | 54,042 | 30,529 | NA | NA |
| 1920 | 105,711 | 51,553 | 31,974 | NA | NA |

*Denotes first year Hawaii and Alaska included in the data.

NA = Not available.

¹ Estimate as of July 1 each year.

² Persons outside urban areas in open country, on farms, and in places with a population less than 2,500.

³ Current definition: Persons on places with at least \$1,000 of agricultural sales. Previous definition: Since 1960, persons on places of 10 acres with at least \$250 of agricultural sales. Prior to 1960, farm residence was based essentially on self-identification of the respondent.

⁴ Sole or primary agricultural employment of persons 16 years old and older. The data are not strictly comparable over time because of definitional changes. Data are annual averages.

⁵ Persons 16 years old and older.

Sources: U.S. Department of Agriculture, Bureau of the Census, Decennial Census of Population and Current Population Reports; U.S. Dept. Labor, Bur. Labor Stat.

bers (at 54 to 55 million) in the last several decades. As a proportion of the total population, however, it has declined from about 45 percent to about 25 percent today.

- The farm population, a subset of the rural population, has declined by 80 percent over the six decades. That is, for every 10 people in the farm population in 1920, there are only 2 today.
- The total agricultural labor force (regardless of residence) has declined by 60 percent, the largest decline being among self-employed owner operators. The hired farmworkers (a subset of the total agricultural work force) has declined since 1950 by about 13 percent, but was relatively stable in the seventies, actually increasing slightly from the low point recorded in 1970.
- Outmigration of people from agriculture over the past 50 years was tremendous, very clearly emphasizing that farm sector earnings are distributed among a much smaller number of people today. This fact has implications for per capita income comparisons across sectors of the economy.

We can see, then, that the farm sector is in a rural setting so amorphous and heterogeneous that it severely limits generalized description: some farmers live in town, some people employed in the nonfarm sector live on farms, farm household members often have nonagricultural employment, and the like. Such conditions are far different from the once much more easily identified group of farm people whose well-being was the objective of a major element of our national public policy.

Agricultural Productivity

Technological innovations and their adoption in the United States released large numbers of people from farming. Growth in the nonfarm economy was at most times sufficient to ensure their rapid absorption. It was this transition—this emergence of excess labor in agriculture and its eventual reabsorption elsewhere in the economy—that formed the basis for the “farm problem” that endured for several decades. This “labor pool” was an important source of aggregate growth in the nonfarm economy; labor with low value in agriculture shifted to higher valued endeavors.

Another perspective on this resource displacement is provided by reviewing the use of labor and other resources and the measures of productivity change in the farm sector (table 5). Total inputs committed to agricultural production have increased only slightly (10.2 percent) since 1920. Yet, the composition (and undoubtedly the quality) of those

inputs has changed markedly. The amount of land has declined only slightly (5.9 percent), but the substitution of capital (machinery and equipment) for labor has been dramatic, making agriculture today one of the most capital intensive sectors of the economy.

The total output obtained with the near constant total input bundle has, of course, increased significantly (152.9 percent) since 1920. Total factor productivity (changes in output obtained from all inputs) has risen by 128.8 percent since 1920, an annual average increase of 2.18 percent (that is, on average, 2.18 percent more output obtained each year with an equivalent amount of inputs). For the almost 60 years considered here, the increase by decade in total factor productivity was:

| <i>Decade</i> | <i>Percentage increase</i> |
|---------------|----------------------------|
| 1920-29 | 0 |
| 1930-39 | 15.7 |
| 1940-49 | 18.3 |
| 1950-59 | 22.5 |
| 1960-69 | 14.4 |
| 1970-79 | 16.7 |

The rate of productivity growth for two of the major inputs, land and labor, presents an interesting picture. The productivity of land, measured as crop production per acre, more than doubled (rising by 113.1 percent) from the twenties through the seventies, increasing most rapidly in the fifties.

Labor productivity rose by a phenomenal 1,314 percent, an average of 22.3 percent per year. This rapid rate of growth would be expected in a labor surplus sector with the surplus outmigrating, and that sector also experiencing extensive technological innovation, as was agriculture. The influx of large amounts of capital with labor emigrating (the capital-labor substitution) was making the remaining labor more productive. Labor productivity grew somewhat in accordance with the emigration of people, generally rising most rapidly when the emigration was most rapid (fig. 2 and table 6). As the labor emigration slows and concludes, the rate of productivity increase will likely slow.

Whether total productivity growth in agriculture is slowing perceptibly is a subject of some controversy. The inability to isolate weather effects and the crudeness of current productivity measures, owing to definitional, procedural, and data limitations, preclude definitive judgments. However, if the rate of productivity growth is indeed slowing and with the readily available land resource (the other source of increased output) largely committed, the prospects for future output expansion are not bright, without a major breakthrough in production technology. This is a time when global food de-

Table 5—Index measures of resource use, output, and farm productivity, 1920-78

| Year | All inputs | Selected inputs | | | Output | | | Productivity (ratio of output to input) | | |
|------------|------------|-----------------|-------------|--------------------------------|-----------|-------|-------|--|-------------------|-------|
| | | Labor | Real estate | Mechanical power and machinery | Livestock | Crops | Total | All inputs | Land ¹ | Labor |
| 1967 = 100 | | | | | | | | | | |
| 1920 | 98 | 341 | 102 | 31 | 44 | 65 | 51 | 52 | 61 | 14 |
| 1930 | 101 | 326 | 101 | 39 | 54 | 59 | 52 | 51 | 53 | 16 |
| 1940 | 100 | 293 | 103 | 42 | 60 | 67 | 60 | 60 | 62 | 20 |
| 1950 | 104 | 217 | 105 | 84 | 75 | 76 | 74 | 71 | 69 | 34 |
| 1960 | 101 | 145 | 100 | 97 | 87 | 93 | 91 | 90 | 89 | 65 |
| 1970 | 100 | 89 | 101 | 100 | 105 | 100 | 101 | 102 | 104 | 115 |
| 1971 | 100 | 86 | 99 | 102 | 106 | 112 | 110 | 110 | 112 | 128 |
| 1972 | 100 | 82 | 98 | 101 | 107 | 113 | 110 | 110 | 115 | 136 |
| 1973 | 101 | 80 | 97 | 105 | 105 | 119 | 112 | 111 | 116 | 130 |
| 1974 | 100 | 78 | 95 | 109 | 106 | 110 | 106 | 105 | 104 | 136 |
| 1975 | 100 | 76 | 96 | 113 | 101 | 121 | 114 | 115 | 112 | 152 |
| 1976 | 103 | 73 | 97 | 117 | 105 | 121 | 117 | 115 | 111 | 162 |
| 1977 | 105 | 71 | 99 | 120 | 106 | 130 | 121 | 114 | 117 | 173 |
| 1978 | 105 | 67 | 97 | 125 | 106 | 131 | 122 | 116 | 121 | 182 |
| 1979 | 108 | 66 | 96 | 129 | 110 | 144 | 129 | 119 | 130 | 198 |

¹ Measured as crop production per acre.

Source: *Changes in Farm Production and Efficiency, 1978*, SB-628, U.S. Dept. Agr., Econ. Stat. Coop. Serv.

mand increases and growing demand for U.S. exports are quite likely.

The Farms and Their Characteristics

Perhaps the best-known characteristic of the farm sector is that the total number of farms over time has declined and the average size has increased (fig. 3). This change has been the most visible manifestation of forces affecting the farm sector: the technological innovations presenting economic efficiencies that could be attained only by farms growing larger, the resulting excess labor, and its emigration. The decline in total farm numbers is also the most likely statistic to be used in discussions of general policy issues such as the status of the family farm. Yet, this statistic, while making a point about what has occurred, conceals much more than it reveals about the farm sector today. This section attempts to look behind the total numbers to the sizes, types, locations, and income and wealth characteristics of today's farms.

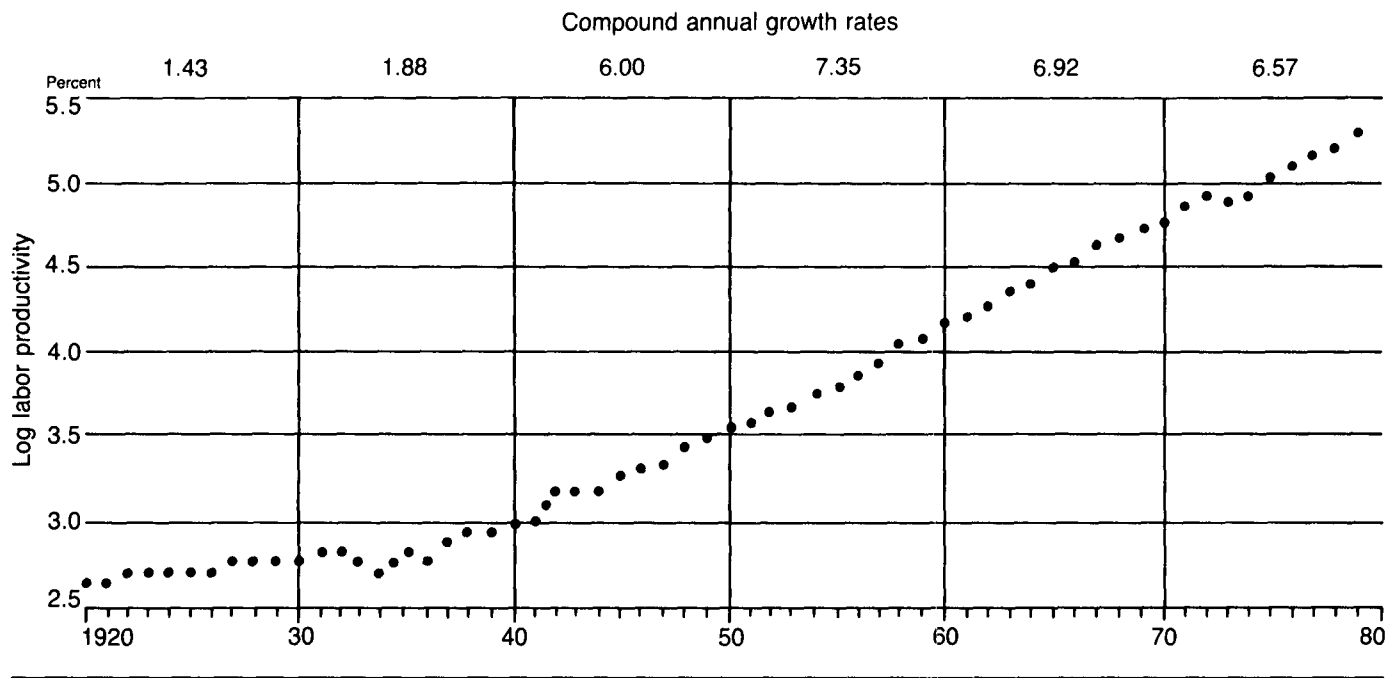
Any discussion of farm numbers and sizes today is importantly conditioned by definitions, perhaps more so than when there were several million farms regardless of how defined. The most widely used source of farm numbers is the

quinquennial agricultural census of the Department of Commerce. The census reports two definitions of a farm, the official one (noted previously) adopted in 1978 and the former one, continued in use for continuity of the data series. (The old definition is used here because it is more consistent with other data presented. The most recently available comprehensive estimates are from the 1974 Census; complete data from the 1978 Census had not been released when this article was written.)

The other source of farm numbers is the Department of Agriculture. These estimates are derived using the Census counts as benchmarks for extrapolation with modifications as suggested by other information.⁷ The Department's estimates for 1978 are shown in table 7.

⁷ The enumeration procedures used in the 1974 Census of Agriculture did not completely count all farms, primarily missing small farms. To account for any discrepancies, a census survey on the completeness of the enumeration was made along with the actual census. Some time after the census data were released, adjustment percentages are made available to account for any differences between the reported census numbers and what are believed to be the "actual" numbers. USDA then uses the adjustment percentages to recalculate the census numbers for publications such as *Farm Income Statistics* and *The Balance Sheet of Agriculture*. (Not all USDA publications use the adjusted estimates.)

Figure 2

Labor productivity increases**Table 6—Average annual productivity growth in agriculture, 1920-79**

| Period | All factors | Land | Labor |
|----------------|-------------|-------|-------|
| <i>Percent</i> | | | |
| 1920-29 | 0 | -0.82 | 1.43 |
| 1930-39 | 1.57 | 1.32 | 1.88 |
| 1940-49 | 1.83 | 1.29 | 6.00 |
| 1950-59 | 2.25 | 2.32 | 7.35 |
| 1960-69 | 1.44 | 1.91 | 6.92 |
| 1970-79 | 1.67 | 2.50 | 7.22 |

The new definition of a farm is more restrictive, counting a place as a farm only if it has product sales of \$1,000 or more, regardless of acre size. This definitional change affects only the number of farms in the smallest sized category (sales less than \$2,500); the number in this category is reduced by about 302,000 (to 609,000), reducing the total number of farms in 1978 to 2,370,000. Thus, the total number of farms in the United States is 2.672 million or 2.370 million depending on the definition used.

The size distribution of these farms reveals additional insight into their characteristics. Shown by value of sales (economic

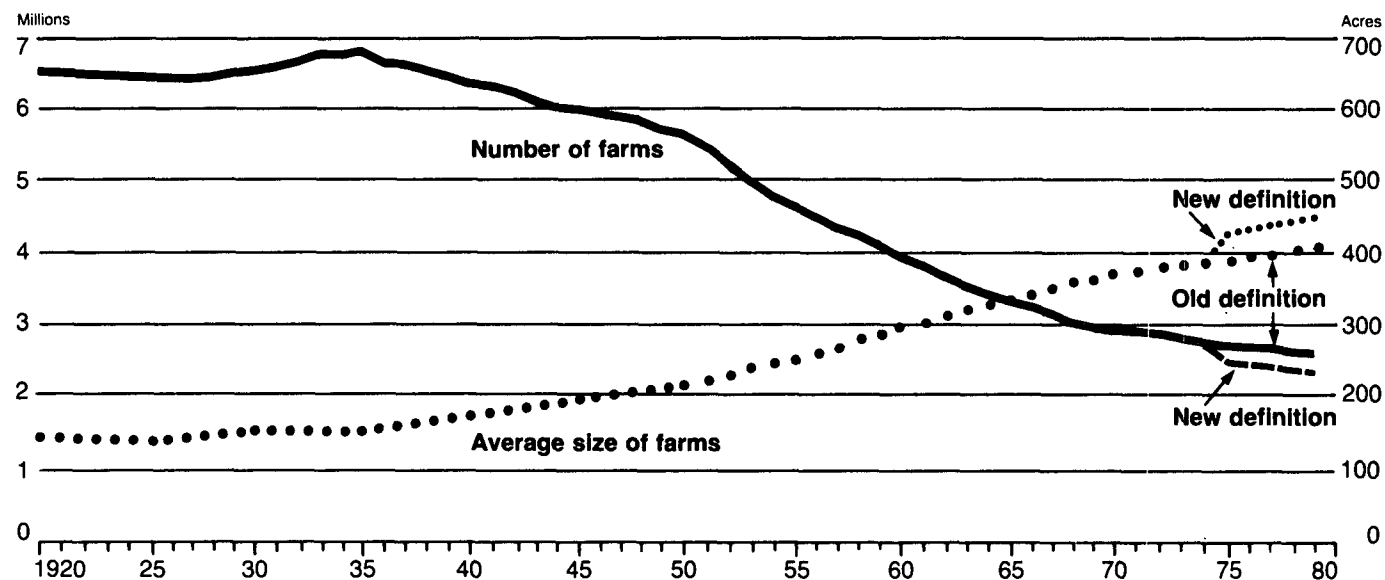
class), the distribution is far from "normal" (an equal proportion of farms of varying sizes both above and below the mean size). It is, in fact, highly skewed toward the smaller sizes; there are many more farms below the mean size than above it.

The profile becomes clearer when we add the contribution of farms in each size category to the total value of all food and fiber production: the numerous smaller farms contribute proportionally much less to total output (table 7). For example, farms below \$10,000 in sales constitute 54.9 percent of all farms, yet they contribute only 4.2 percent of the total sales. Farms with under \$40,000 in gross sales are 78.0 percent of all farms but account for only 18.3 percent of total sales. Conversely, farms selling over \$40,000 are only 22.0 percent of all farms but account for 81.7 percent of gross sales. Further, the largest farms, those having gross sales in excess of \$200,000, comprise only 2.4 percent of the total but produce 39.4 percent of the total sales.

The concentration of production among the larger farms is obvious. These data also suggest that there would be many economically disadvantaged farm families (and many below the poverty criterion) on the smaller farms if farming were

Figure 3

Number and average size of farms



Sources: Average size of farms 1920-50 from 1964 Census of Agriculture. All other data from Crop Reporting Board, USDA.

Table 7—Number of farms and off-farm income by value of sales, 1978

| Farm size by value of sales | Farms | | Value of sales | | Off-farm income | |
|--------------------------------|--------------|----------------|-------------------|----------------|-------------------|----------------|
| | <i>Thou.</i> | <i>Percent</i> | <i>Mil. dols.</i> | <i>Percent</i> | <i>Mil. dols.</i> | <i>Percent</i> |
| Less than \$2,500 | 911 | 34.1 | 1,056 | 0.9 | 15,674 | 45.4 |
| \$2,500-\$4,999 | 275 | 10.3 | 1,270 | 1.1 | 4,486 | 13.0 |
| \$5,000-\$9,999 | 281 | 10.5 | 2,579 | 2.2 | 3,846 | 11.1 |
| \$10,000-\$19,999 | 294 | 11.0 | 5,219 | 4.4 | 3,126 | 9.1 |
| \$20,000-\$39,999 | 323 | 12.1 | 11,405 | 9.7 | 2,551 | 7.4 |
| \$40,000-\$99,999 | 398 | 14.9 | 29,556 | 25.2 | 2,762 | 8.0 |
| \$100,000-\$199,999 | 126 | 4.7 | 20,025 | 17.1 | 1,253 | 3.6 |
| Over \$200,000 | 64 | 2.4 | 46,275 | 39.4 | 801 | 2.3 |
| Total | 2,672 | 100.0 | 117,385 | 100.0 | 34,499 | 100.0 |

Source: *Farm Income Statistics*, U.S. Dept. Agr., Econ. Stat. Coop. Serv., 1979.

the sole or even the primary source of income. A farm that grosses only \$40,000, even with the best of management, is unlikely to provide a net income to the operator and family that would be considered adequate today (certainly not near the national median income). On many of the smaller farms, however, the income is supplemented by a larger amount of income from nonfarm sources.

Since a central consideration to farm policy has traditionally been the level of incomes in the farm sector, that question merits further examination from two views: that of the economic well-being of farm people and the sustained economic viability of farm businesses. Are total incomes of farm people below a socially acceptable norm? Are the rates of return to investments in farm businesses sufficient for continued viability (survival)?

The Economic Well-Being of Farm People^a

It is now widely recognized that examining only the average income of farm operator families from farm sources gives a misleading indication of the well-being of farm families (6). The significant incidence of off-farm income earned by farm families is a relatively new phenomenon, having grown rapidly

^aThe generalizations in this and subsequent sections are conditioned by a rather fundamental limitation of the data. The census statistics assume a single operator per farm; there is no information on the frequency or the distribution of multiple-person operations across farm sizes. Recent observations suggest, however, that the larger operations tend much more to be two- or three-person operations, and that one or more of these individuals is often young. To the extent that multiple operators occur, one may well overestimate the differential in well-being of operators on such units relative to the smaller single-operator farms. Likewise, there are no data on the nonfarm earnings of a second or third partner in such operations.

Table 8—Off-farm income per farm operator family as a percentage of net farm income, 1960-78

| Farm sales | 1960-64 | 1965-69 | 1970-74 | 1975-78 |
|--------------------|---------|---------|---------|---------|
| | Percent | | | |
| Less than \$2,500 | 408 | 646 | 857 | 1,006 |
| \$2,500-\$4,999 | 128 | 261 | 472 | 902 |
| \$5,000-\$9,999 | 68 | 130 | 217 | 423 |
| \$10,000-\$19,999 | 31 | 54 | 91 | 174 |
| \$20,000-\$39,999 | 24 | 30 | 38 | 66 |
| \$40,000 and over | 17 | 22 | 17 | 25 |
| \$40,000-\$99,999 | NA | 23 | 21 | 30 |
| \$100,000 and over | NA | 20 | 14 | 21 |
| All farms | 89 | 115 | 104 | 141 |

NA = Not available.

Source: Adapted from *Farm Income Statistics*, U.S. Dept. Agr., Econ. Stat. Coop. Serv.

in the last two decades (table 8). Off-farm income is of greater importance to the smaller farms, exceeding farm income by several times over for farms with sales under \$20,000.

Off-farm income declines as a proportion of farm income as the size of farm increases; it declines from being 10 times greater than farm income for the smallest farms to only one-fifth of farm income for the largest farms during 1975-78. Today, in the aggregate, nonfarm income earned by farm families exceeds their net earnings from farming. Including income from all sources, the average income per farm operator family in 1978 was almost \$24,000, 36 percent more than national median family income.

The addition of nonfarm income has contributed to a much more equal distribution of total income among farm families, narrowing the income disparity considerably (fig. 4). This also emphasizes the close link of the economic well-being of a majority of farm families to the nonfarm economy, a linkage growing stronger over time. When total income is compared with median income of the total population, only two size categories of farms are slightly below. These size categories are somewhat "in between," neither totally reliant on off-farm income nor large enough to achieve comparable farm incomes.

Sources of the nonfarm income for smaller farms could be especially revealing for policy purposes if they provided insights into the motivation of people living there. Are many of these small farms really rural residences only? Is income from wages or salaries earned by the household head in an occupation other than farming? Or do other family members earn this income in supplementary employment? Unfortunately, little information on such questions is now available. (Surveys are currently being conducted to provide data on the occupational status and income composition of farm families.) However, some insights can be gained from studies with data from varying time periods. One study of family income in 1973 focused on the level, sources, and distribution of income for four groups of farm families (3):

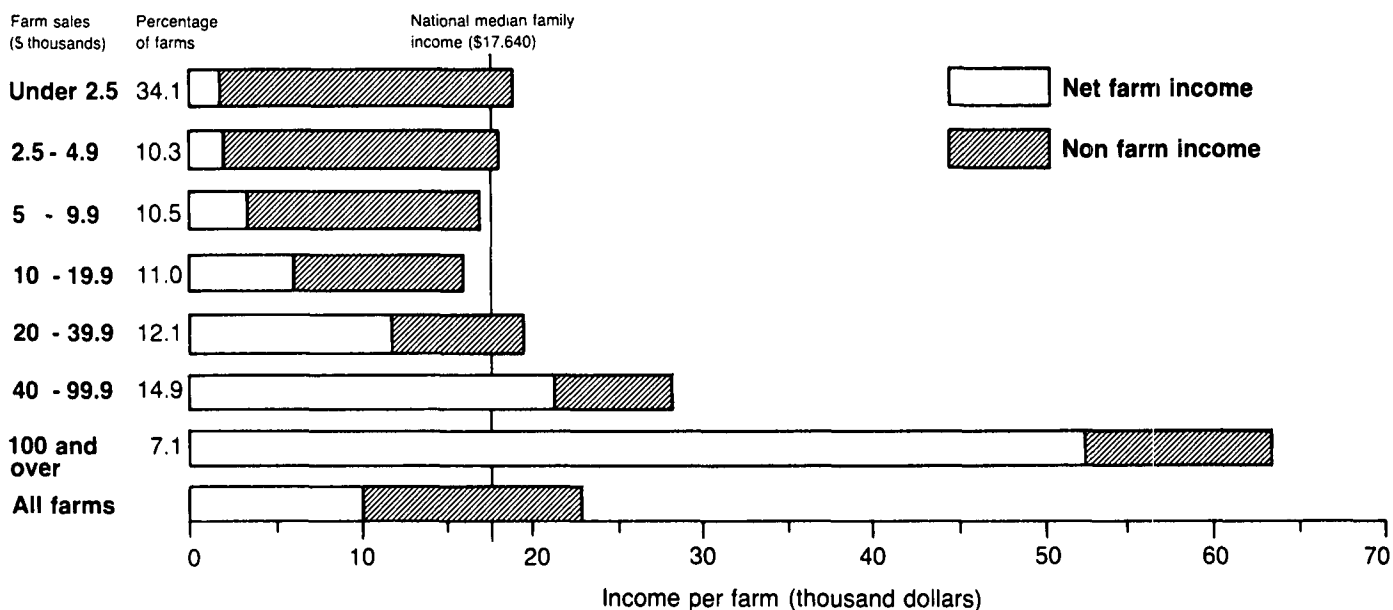
- Low-income farm operator households.
- Households associated with small farms.
- Households dependent solely on farming.
- Households dependent primarily on off-farm income.

The findings revealed:

- Only 1 in 12 farm families depended entirely on farming for their income in 1973; 9 in 12 had income from wages and salaries, the most important source of nonfarm income. Generally, as total family income rose, the portion from wages and salaries rose, except at the highest income levels.

Figure 4

Income per farm family, by farm sales, 1978



- Farm families reporting farm profits averaged significantly higher total incomes than families reporting farm losses. Farm losses reported were small, and frequently reported by younger operators who had higher wage and salary earnings, and less total income from nonwork sources (dividends, rents, and royalties). The most frequently reported sources of off-farm income were wages and salaries, nonfarm business returns, pensions (including Social Security payments), unemployment compensation, private pensions, welfare payments, and investment income (interest, rents, royalties).
- Regional disparities in incomes were associated with non-farm job opportunities and farm household characteristics. Most low-income farm families were in the South and associated with the older farm households. The absence of a full-time wage earner in the household contributed to the low-income problem. Farm-income-only households had a much higher probability of being in the low-income category than did households reporting income from both farm and nonfarm sources.
- Small farms and low-income households are not synonymous. Low farm income may contribute to low household income, but except for farm-income-only households, it is not the sole cause of poverty.

- The average farm product sales of families with only farm income were almost four times as great as those of families with farm and nonfarm income. The farm-income-only operator was younger and had a slightly larger family than did operators with both farm and nonfarm income.
- About 10.6 percent of the farm families (301,000) were below the poverty threshold in 1973 (compared with roughly 14 percent of the total population), with the greatest concentration in the South.

Total income for all farm size categories, and notably the smaller sizes, compared favorably with incomes earned elsewhere in the economy. From examining average total annual (current) income per farm for the sector as a whole, one must conclude that incomes of farm people are no longer low by any reasonable standard. This does not mean there are no farm families with low incomes nor that there is not considerable poverty remaining (according to Crecink (3)). But low income and poverty seem associated with particular circumstances and geographic regions, and are not pervasive across the entire farm sector as was once the case.

While policies designed to improve farm income would benefit all farm operators to varying extents, the benefits and

impacts on household income would vary directly according to the reliance of the household upon farm income, and to the size of the farm operation.

Policies to enhance farm incomes are of little benefit to the 1.8 million farms (65.9 percent of all farms) with sales of less than \$20,000. This is borne out by studies of the distribution of farm program benefits which reveal that the greatest proportion of the benefits accrue to the larger farmers, those with the greatest volume of production, hence greatest farm income. For example, direct payments made in 1978 under the commodity programs were distributed as shown in table 9.

Table 9—Distribution of commodity program payments, by commodity, 1978

| Commodity | Payments received by— | | | |
|------------|---|-------------------------------|-------------------------------|--------|
| | Smallest 50 percent of farmers ¹ | Largest 50 percent of farmers | Largest 10 percent of farmers | |
| | ----- Percent ----- | | | Number |
| Wheat | 10.9 | 89.1 | 50.5 | 38,734 |
| Cotton | 6.2 | 93.8 | 53.3 | 5,045 |
| Rice | 7.0 | 93.0 | 39.8 | 1,658 |
| Feed grain | 13.3 | 86.7 | 39.5 | 62,037 |
| Total | 9.7 | 90.3 | 46.0 | 73,635 |

¹ Producers were arrayed by the size of their normal cropland acreage (NCA—determined for program purposes). The “smallest 50 percent of farmers” thus means the 50 percent of farmers with the smallest NCA's.

Source (8).

The Economic Viability of Farm Businesses

The last section examined income in the sense of well-being of farm people—but what about well-being of the farm business in an economic sense? That is, what are the earnings of resources productively employed by farm businesses?

In economic parlance, a business firm is viable over the long run if it generates enough income to pay all the factors of production employed (land, labor, capital, and management) and earns a rate of return sufficient to hold them in the particular business endeavor. Alternatively stated, the rate of return must be comparable to rates that could be earned elsewhere or (under certain assumptions, such as complete factor mobility) they will move to another endeavor where the return is greater. This shift is precisely what happened in agriculture. For several decades, agriculture's annual income was insufficient when distributed among all resources to provide returns comparable to those earned elsewhere. A “low” rate of return resulted, and the excess resources gradually shifted to other sectors of the economy where the earnings were greater. But, with the assertions that the farm sector is in relative resource equilibrium today, how do earnings compare with the nonfarm sector?

Rate of Return for the Farm Sector. Several inferences may be drawn from estimates, going back to 1940, of the rate of the return to equity (current market value of assets less the outstanding debt) in agricultural production assets from current income (gross receipts less production expenses including interest paid and operator and family labor and asset appreciation) (table 10).

Table 10—Returns to investment equity in farm production assets, selected periods, 1940-1979

| Period | Equity in assets | Residual income to equity | Real capital gains | Rate of return to equity investment from— | | |
|---------|---|---------------------------|--------------------|---|---------------|-------|
| | | | | Current income | Capital gains | Total |
| | ----- <i>Billion dollars (1967)</i> ----- | | | ----- <i>Percent</i> ----- | | |
| 1940-44 | 81.3 | 6.3 | 6.2 | 7.8 | 7.4 | 15.2 |
| 1945-49 | 115.8 | 8.3 | 1.1 | 7.2 | 1.0 | 8.2 |
| 1950-54 | 133.1 | 6.4 | .8 | 4.9 | .8 | 5.7 |
| 1955-59 | 144.5 | 4.1 | 6.9 | 2.8 | 4.8 | 7.7 |
| 1960-64 | 161.8 | 5.3 | 5.0 | 3.3 | 3.1 | 6.4 |
| 1965-69 | 178.3 | 7.3 | 5.4 | 4.1 | 3.1 | 7.2 |
| 1970-74 | 192.0 | 11.8 | 13.2 | 6.1 | 7.0 | 13.1 |
| 1975-79 | 241.4 | 8.8 | 19.6 | 3.7 | 8.2 | 11.9 |

Note: Farm production assets are valued at current market prices deflated to a constant dollar basis. Residual income to equity equals income to production assets minus interest on real estate and non-real estate debt.

Source: Data from *Balance Sheet of the Farming Sector* (1979 supplement), AIB-430, U.S. Dept. Agr., Econ. Stat. Coop. Serv., Feb. 1980.

- Higher returns in the form of current incomes during the forties reflected the high commodity prices resulting from wartime conditions. Total returns were relatively stable through the fifties and sixties. The seventies boom is reflected in both current income and capital returns.
- The return in the form of capital gains reflects increases in the value of the largest production asset, land. These returns were relatively stable through the immediate post-World War II decade and the sixties, but then increased rapidly, reflecting the rapid escalation in land prices that began after 1972.
- The average total return to equity is appreciably higher for the seventies than in the previous three decades (excluding the war years of the early forties).

When discussing rates of return to the farm sector and including increases in asset values (capital gains), objections are always certain to arise. The objections, in essence, are that the capital gains are unrealized (they are nonliquid wealth—the increase cannot be captured without selling the asset). In the case of land, this is an unreasonable action for one wishing to continue operating a farm business. However, the capital gains can be converted to cash by borrowing against them for farm expansion.

The inappropriateness of adding the rate of return from current income with the rate of return from nominal capital

gains has been pointed out by Melichar (11) and others. However, they have also overcome this objection by calculating the real return from asset appreciation (capital gains) which is comparable with net income. Real capital gains (the increase in wealth after adjusting for inflation) represent the amount of increase in the wealth of the farm business that could be taken out without reducing the real wealth position, the viability (proportion of equity) of the business. Thus, real increases in asset values are no less a return to farming than current income.

Total returns to agriculture increased appreciably in the seventies. Yet, this information tells us little about relative resource equilibrium unless we can compare with earnings elsewhere in the economy. Such comparisons have limitations, but some useful insights can be gained.

Current income and capital gains returns to common stock and long-term Government bonds are usually viewed as representative earnings in the nonfarm economy. Estimates of returns of stocks and bonds compared with estimates of farm sector earnings permit some interesting observations (table 11; and again recognizing that the three types of returns are not strictly comparable):

- Rates of return to current income among all three investments do not differ greatly over the entire 30-year period, and especially in the past 15 years. Long-term bonds consistently but not greatly outperformed the

Table 11—Rates of return to stocks, bonds, and farm assets, selected periods, 1950-79¹

| Period | Current income | | | Real capital gains | | | Total | | |
|---------------------------------|----------------|-----------------|-------------|--------------------|-----------------|-------------|--------------|-----------------|-------------|
| | Common stock | Long-term bonds | Farm assets | Common stock | Long-term bonds | Farm assets | Common stock | Long-term bonds | Farm assets |
| | Percent | | | | | | | | |
| 1950-54 | 5.85 | 2.61 | 4.95 | 11.95 | - 1.69 | 3.28 | 17.53 | 0.92 | 8.23 |
| 1955-59 | 3.94 | 3.38 | 3.18 | 13.12 | - 4.65 | 4.02 | 17.06 | -1.27 | 7.19 |
| 1960-64 | 3.20 | 4.00 | 3.61 | 7.45 | - 1.49 | 2.42 | 10.65 | 2.51 | 6.02 |
| 1965-69 | 3.18 | 5.01 | 4.46 | 1.61 | - 9.09 | 2.48 | 4.79 | -4.08 | 6.94 |
| 1970-74 | 3.47 | 6.25 | 6.26 | -8.66 | - 8.65 | 6.15 | -5.19 | -2.40 | 12.41 |
| 1975-79 | 4.68 | 7.49 | 4.50 | -4.09 | -12.06 | 5.10 | .59 | -4.57 | 9.60 |
| Coef. of variation ² | 22 | 26 | 34 | 281 | 192 | 106 | 152 | 185 | 60 |

¹ The farm asset returns in this table differ from those in table 10 because the estimates in this table are based on total value of assets while those in table 10 are based on owner equity in those assets. Data on owner equity were not available for stocks and bonds, hence it was not possible to compare returns to equity.

² The coefficient of variation is the standard deviation of the data series divided by the mean and expressed as a percent. The higher the number, the greater is the variability.

Source: Stock and bond returns were adapted from David A. Lins, "Financial Performance and Economic Well-Being of the Farm Sector and Rural People," (mimeo) U.S. Dept. Agr., Econ. Stat. Coop. Serv. Farm asset returns were calculated from data in annual issues of *Farm Income Statistics*, U.S. Dept. Agr., Econ. Stat. Coop. Serv.

other two. Judged by the coefficient of variation, farm income is the most volatile of the three.

- Capital gains returns to equity are greater for stocks and farm assets than for long-term bonds. Stocks outperformed farm assets in the fifties and sixties, but the reverse occurred in the seventies. Interestingly, farm capital gains returns are much more stable than returns to the other two.
- During the past 15 years, rates of total returns to farm investment equity have substantially exceeded investments in common stocks and bonds. Although annual farm income is the most variable, it is more than offset by the less variable capital gains returns. Thus, variability (risk) in the farm investment has been substantially lower than investment in the other two.

Overall, these data suggest that, to the extent that stocks and bonds are good proxies for both current income and capital gains returns, the agricultural sector lagged until the late sixties but now enjoys comparable or superior rates of earnings.

These data also suggest that the earnings performance of agricultural land investment could have major implications in the future. Rising land prices are frequently accused of disenfranchising younger and lower equity farmers from the market and of concentrating the land purchases among the more established farmers who can withstand a negative cash

Table 12—Returns to investment equity in farm production assets by size of farm, 1970

| Sales class size | Average investment equity | Rate of return | | |
|------------------------|---------------------------|--------------------------|---------------|-------|
| | | Current income | Capital gains | Total |
| | <i>Dollars</i> | <i>-----Percent-----</i> | | |
| Less than \$2,500 | 22,208 | -6.1 | 3.7 | -2.4 |
| \$2,500-4,999 | 38,898 | -6.5 | 3.9 | -2.6 |
| \$5,000-9,999 | 55,058 | -.1 | 4.2 | 4.1 |
| \$10,000-19,999 | 84,489 | 2.9 | 4.4 | 7.3 |
| \$20,000-39,999 | 128,345 | 4.4 | 4.5 | 8.9 |
| \$40,000-99,999 | 201,493 | 5.9 | 4.7 | 10.6 |
| \$100,000 and over | 522,027 | 6.9 | 4.3 | 11.2 |
| All farms | 69,736 | 2.1 | 4.3 | 6.4 |
| All but smallest class | 100,294 | 3.3 | 4.4 | 7.7 |

Note: The capital gains estimates are nominal, not real, unlike the estimates in the previous tables, which are in real terms.

Source: Adapted from J. Bruce Hottel and Robert D. Reinsel, *Returns to Equity Capital by Economic Class of Farm*, AER-347, U.S. Dept. Agr., Econ. Res. Serv., Aug. 1976.

flow (by supplementing farm income with other income sources) in order to realize the capital gains later. This, of course, holds their savings together in real terms and provides a net surplus. However, it is not only just farmers who seek to hold together their savings. The largest single source of savings in this country is pension funds, which have recently been badly battered, in real terms, by inflation. A Midwest group planning to invest pension funds in farmland has been the subject of recent press attention and a congressional hearing. If there are more such efforts in the future, as seems likely, they could become a major economic factor in the coming decade, as all sorts of groups outside the farm establishment seek to realize the kinds of capital gains from assets enjoyed in the past decade. Such an influx of nonfarm capital into the farm sector could be a major factor in determining how future policy would work. This would mean that not only young farmers will have difficulty in buying land, but older farmers as well will meet increased competition from bidders with large amounts of capital to invest.

Useful additional detail for a farm profile would be estimates of rates of return by size of farm. Unfortunately, the only such data available are now over a decade old (table 12).⁹

These data show that smaller farms had negative returns to investment equity. They did so because their net income became negative after subtracting from the gross income an imputed return for operator and family labor and management. The returns increase as farm size increases. By the time a farm reaches \$20,000 of gross sales, the total return appears generally comparable to that in the nonfarm sector. One could reasonably expect that the patterns will be reconfirmed by the 1979 data. Inflation and farm size adjustments, however, will probably push up the gross sales to greater than \$40,000 to achieve rates of returns comparable with those in the nonfarm sector.

Income and Returns Variability. Two important facets to rates of return from annual income and asset appreciation are the amount and the variability of the rate of return. Total income to farm families in recent years compares favorably with the national median family income. The total rate of return to investment in farm businesses since about 1970 compares favorably with rates of return in the nonfarm economy. But, what about the variability or stability of current income and investment earnings?

Some insights are obtained by measuring the variability in commodity group prices and incomes for three periods (table 13):

⁹That information was obtained for 1970 from a special survey by the Census of Agriculture. A similar survey was conducted for 1979 as a follow-on to the 1978 census but the data are not yet available. However, it is unlikely that the general pattern of earnings changed significantly.

Table 13—Variation in farm income and product prices, selected periods, 1950-78

| Item | Coefficient of variation ¹ | | |
|--|---------------------------------------|---------|---------|
| | 1955-63 | 1964-71 | 1972-78 |
| | <i>Percent</i> | | |
| Index of prices received: | | | |
| All products | 2.6 | 5.9 | 14.6 |
| Crops | 2.9 | 3.8 | 18.9 |
| Livestock | 5.5 | 11.3 | 13.7 |
| Cash receipts: | | | |
| Crops | 10.4 | 9.1 | 20.6 |
| Livestock | 8.3 | 14.6 | 15.7 |
| Personal income received by the farm population: | | | |
| Farm income less Government payments | 9.4 | 18.6 | 24.3 |
| Farm income | 6.3 | 14.1 | 21.7 |
| Nonfarm income | 12.5 | 16.0 | 15.7 |
| All sources | 5.5 | 12.1 | 13.9 |

¹ The coefficient of variation is the standard deviation of the data series divided by the mean and expressed as a percent.

- The periods of 1955-63 and 1964-71 were stable relative to 1972-78: variability in prices received for all products increased sixfold, over sixfold for crop prices, and over twofold for livestock prices. The variability in cash receipts from crops increased over twofold.
- The variability in farm income was over three times as great in the seventies as in 1955-63. Income variability in all periods is reduced by Government payments, and reduced further when income from nonfarm sources is included.
- Nonfarm income received by the farm population was relatively stable in all three periods, primarily reflecting economic conditions in the nonfarm economy.

Overall, these estimates confirm that farm income variability has increased for the entire sector in recent years.

Analyzing the distribution of income to the farm operator families by source and by size of farm for the sixties and the seventies allows one to look beyond sector aggregates (table 14):

- Variability in farm income increased substantially for farms of all sizes in the seventies over the sixties.

- Farm income varies significantly more for farms with over \$40,000 in gross sales than for those with less gross sales. This difference is due to the larger proportion of total income from farm sources for the larger farms.
- Total income is less variable than farm income alone because adding nonfarm income reduces variability for all sales class sizes.
- For farms under \$20,000 in gross sales, total income was highly stable. As this income is mainly from wages and salaries, household incomes on these farms are little affected by farm income variability.

Overall, income varied more in the seventies than in the sixties. Furthermore, since farm income is proportionally a smaller part of total income on small farms than it is on large farms, small farms are less affected by fluctuations in farm earnings.

The implications of this increased economic instability in the farm sector are perhaps more significant today than in previous times, when farm families were thought to be very resilient. During periods of adverse economic conditions, they "tightened their belts," reduced personal consumption expenditures, and weathered the period until conditions improved. They were much less dependent on purchased inputs from the nonfarm sector and their fixed annual cash obligations were relatively small. Today, however, farmers purchase a high proportion of annual production inputs and many have substantial annual debt repayment obligations for their fixed assets (machinery and land).

Table 14—Variability in farm income per farm operator family by size of farm, selected periods, 1960-78

| Sales class | Coefficient of variation | | | |
|--------------------|--------------------------|---------|-------------------|---------|
| | Net farm income | | Total income | |
| | 1960-72 | 1973-78 | 1960-72 | 1973-78 |
| | <i>Percent</i> | | | |
| Less than \$2,500 | 8.5 | 10.8 | 33.2 | 15.6 |
| \$2,500-\$4,999 | 6.9 | 16.2 | 30.6 | 14.6 |
| \$5,000-\$9,999 | 4.4 | 16.0 | 23.9 | 12.2 |
| \$10,000-\$19,999 | 6.8 | 15.7 | 18.9 | 7.3 |
| \$20,000-\$39,999 | 11.9 | 13.7 | 15.0 | 7.7 |
| \$40,000-\$99,999 | 12.9 | 15.2 | ¹ 8.6 | 10.7 |
| \$100,000 and over | 19.6 | 32.0 | ¹ 16.3 | 26.5 |

¹ For 1965-72.

Source: *Farm Income Statistics*, U.S. Dept. Agr., Econ. Stat. Coop. Serv.

For example, the ratio of cash production expenses to gross farm income has trended upward since World War II (table 15). The increased reliance on purchased inputs and borrowed capital varies by farm size, and the ratio is much higher for the larger farms. Likewise, the debt-to-asset ratio is much higher for the larger farms, which shows the added cash requirement for annual debt servicing (table 16). This has important implications for the cash flow situation of the primary farms (those producing most of the food and fiber—discussed in the next section).

The implications of an increasing ratio of cash production expenses to gross receipts are illustrated by the effects it has on variation in net income (table 17). A given increase in production expenses (or reduction in cash receipts) is much

more severe the greater the dependence on purchased inputs (the higher the ratio). The import of this is that more and more farms are vulnerable at a time when the increased dependence on foreign markets means greater potential variability in market prices, hence variability in cash receipts.

The "Primary" Farms

The diversity in the contemporary farm sector suggests that future policies will need to be based on more careful identification of problems and targeting of the subgroups of farms that each policy is to treat.

At least two and perhaps three types of farms can be grouped according to some common characteristics. Those whose production is small and whose nonfarm incomes are relatively high may be simply rural residences and hobby farms. At a minimum, the smallest size category (under \$2,500 in sales) would be included, and reasonably the next size category, between \$2,500 and \$5,000, could be included as well. This group, which might be labeled "rural farm residences," encompasses 44.4 percent of all farms today.

A second group (which could be called "small farms") might include the next three sales class categories (\$5,000 to \$40,000 in sales). Most of these farms produce too little product to be able to rely fully or primarily on farming for a livelihood and must depend on supplemental nonfarm income, but to a lesser extent than do the smallest farms.

A third category (called "primary farms"—over \$40,000 in gross sales) depends primarily upon farming and produces most of the Nation's food and fiber.¹⁰ This and perhaps the middle group as well, are the ones of major interest for commodity policy. The primary farms group is now examined in greater detail.

¹⁰ The dollar boundaries on these delineations will change over time. For example, the \$40,000 boundary would shift upward over time, as inflation and technology reduce the real value of that amount of sales.

Table 15—Cash production expenses as a percentage of cash receipts, selected periods, 1935-78

| Period | All farms | Farms with gross sales of— | | |
|---------|-----------|----------------------------|-----------------------|---------------------|
| | | Less than \$40,000 | \$40,000 to \$100,000 | More than \$100,000 |
| | | <i>Percent</i> | | |
| 1935-39 | 59.8 | NA | NA | NA |
| 1940-45 | 56.3 | NA | NA | NA |
| 1946-49 | 53.4 | NA | NA | NA |
| 1950-54 | 58.7 | NA | NA | NA |
| 1955-59 | 63.2 | NA | NA | NA |
| 1960-64 | 67.1 | 60.2 | 71.8 | 85.6 |
| 1965-69 | 68.5 | 59.6 | 69.4 | 84.8 |
| 1970-74 | 67.4 | 55.9 | 63.9 | 80.6 |
| 1975-78 | 72.1 | 57.4 | 63.5 | 81.3 |

NA = Not available.

Note: Cash receipts include marketings from livestock and crops, Government payments, and income from recreation, machinery hire, and custom work. Cash expenses include operating expenses, taxes, interest on farm mortgage debt, and rent to nonoperator landlords.

Table 16—Debt to asset ratio, by farm size, selected years, 1960-78

| Year | All farms | Farm size | | | | | | |
|---------|-----------|-------------------|--------------------|--------------------|----------------------|----------------------|----------------------|--------------------|
| | | Less than \$2,500 | \$2,500 to \$4,999 | \$5,000 to \$9,999 | \$10,000 to \$19,999 | \$20,000 to \$39,999 | \$40,000 to \$99,999 | \$100,000 and over |
| | | <i>Percent</i> | | | | | | |
| 1960-64 | 13.5 | 8.1 | 10.2 | 12.9 | 15.0 | 15.0 | 15.2 | 18.8 |
| 1965-69 | 16.3 | 9.2 | 9.4 | 14.4 | 17.8 | 17.8 | 19.2 | 23.4 |
| 1970-74 | 16.4 | 5.1 | 8.8 | 11.5 | 15.5 | 17.8 | 19.7 | 24.9 |
| 1975-78 | 16.0 | 4.7 | 6.9 | 7.6 | 12.2 | 14.9 | 18.2 | 24.9 |

Source: *Balance Sheet of the Farming Sector*, 1976, 1978, and 1979 Supplement, U.S. Dept. Agr., Econ. Stat. Coop. Serv.

Table 17—Sensitivity of annual net income to changes in production expenses

| Item | Production expenses as percentage of cash receipts | | |
|--|--|-----|-----|
| | 70% | 85% | 90% |
| <i>Dollars</i> | | | |
| Gross receipts | 100 | 100 | 100 |
| Production expenses | 70 | 85 | 90 |
| Net cash income | 30 | 15 | 10 |
| <i>Percent</i> | | | |
| 10-percent increase in production expenses | 77 | 94 | 99 |
| Net cash income | 23 | 6 | 1 |
| <i>Percent</i> | | | |
| Decrease in net cash income | 23 | 60 | 90 |

The 1974 census counted 476,909 farms with gross sales of at least \$40,000 (such farms were estimated to have increased to 577,000 in 1978). These farms constituted 19.3 percent of all farms and accounted for 78.4 percent of total farm output in 1974. These farms will most likely influence the effectiveness of the commodity programs as now structured, and they will be the largest beneficiaries of the program benefits, so their characteristics are of further interest. What do they produce? How viable are these farm businesses?

The census of agriculture classifies farms by type based on the Standard Industrial Classification (SIC) codes of the Department of Commerce. These codes place a farm in a particular classification according to the commodity that accounts for more than 50 percent of the gross sales of the farm. Thirteen major farm types are delineated by the census (table 18). Of farms grossing over \$40,000 in sales in 1974, livestock farms (including dairy, poultry, animal specialty, and general livestock) accounted for 45.5 percent of the total; crop farms (grains, cotton, sugar, tobacco, and general crop) made up 48.8 percent; and horticultural and various other miscellaneous types constituted the remaining 5.7 percent. Cash grain and cotton farms, those for which the major crop commodity programs have been operated for over half a century, were about 40 percent of this total.

The contribution of total sales by size of farms within each of these types is further revealing (table 19). As expected, production is concentrated; a relatively small number of producers accounts for a much larger proportion of total output. Concentration varies by type from the larger sugar, peanut, and other farms that produce virtually all the product to the tobacco farms, of which the larger farms produce only 44 percent of the output. The larger cash grain farms (38 per-

Table 18—Farms with over \$40,000 in sales, by type, 1974

| Type | Farms | |
|--------------------------|---------------|----------------|
| | <i>Number</i> | <i>Percent</i> |
| Cash grain | 179,701 | 37.7 |
| Cotton | 9,500 | 2.0 |
| Sugar, peanuts, potatoes | 22,966 | 4.8 |
| Dairy | 78,083 | 16.4 |
| Poultry, eggs | 32,537 | 6.8 |
| Horticultural | 6,578 | 1.4 |
| Livestock | 100,036 | 21.0 |
| Tobacco | 8,886 | 1.9 |
| Vegetable and melon | 6,000 | 1.3 |
| Fruit and tree nut | 13,769 | 2.9 |
| General crop farms | 11,566 | 2.4 |
| Animal specialty | 1,703 | .4 |
| General livestock farms | 4,518 | .9 |
| Not classified | 1,066 | .2 |
| Total | 476,909 | 100.0 |

Source: 1974 Census of Agriculture.

cent of all farms with over \$40,000 sales but only 7.3 percent of all farms) made 74.1 percent of total sales.¹¹

To delineate a set of primary grain farms for analysis of commodity policy, one must identify the specific grain crops produced. The census data do not, however, enable such an identification directly. It must, therefore, be done indirectly, by identifying the major grain producing States by type of grain produced (from census acreage data) and assuming that farms in these States produce these grains. Using this procedure gives 115,394 primary grain farms in the 10 major wheat- and corn-producing States (the remaining 64,000 primary grain farms are spread throughout the Nation):

| State | Farms |
|--------------|--------|
| Wheat: | |
| Kansas | 12,957 |
| North Dakota | 10,952 |
| Washington | 3,447 |
| Montana | 4,209 |
| Oklahoma | 3,909 |
| Total | 35,474 |

-- tabulation continues

¹¹ This percentage indicates only that large cash grain farms account for 74.1 percent of the sales of all cash grain farms. We do not know what proportion of the grain they produce or how much grain is produced on other farms. It appears, however, that the grain produced on the farms in this type and produced on farms of other types in this size category is a large proportion of all grain produced.

| State | Farms |
|----------------|--------|
| Corn/soybeans: | |
| Illinois | 26,328 |
| Iowa | 23,446 |
| Nebraska | 11,513 |
| Indiana | 11,271 |
| Ohio | 7,362 |
| Total | 79,920 |
| Cotton: | |
| Texas | 2,250 |
| California | 1,148 |
| Arkansas | 933 |
| Arizona | 620 |
| Mississippi | 1,953 |
| Total | 6,934 |

Having identified these farms, some notion of the nature of these farming operations can be obtained by looking at averages of these farms (table 20; and again recognizing the limitations of averages in the diverse agriculture of today).

Based on census data, current income and capital gains returns were computed and compared with the operator's average equity in the farm business to show the average financial situations of these farms (table 21). Returns varied by State, but total rates of return were comparable with returns in the nonfarm economy for 1974 (see table 13). Likewise, total in-

come (farm and nonfarm) accruing to farm operator families was comparable with the median family income for 1974.

Again, these are average situations. The average amount of operator equity in these farm businesses is large, and cash flow requirements are much less stringent than for a renter or beginning farmer who is more likely to have a much smaller equity.¹²

Economies of Size

The farm size efficiency tradeoff has long been a major argument in farm policy considerations. Conventional wisdom has held that technological advancements over time have created efficiencies that could more effectively be captured by farms growing larger (by substituting machines for labor with the investment cost of the machine per acre or per unit of output being reduced through increasing the farm size up to some point). Further, the cumulative impact is seen as the consolidation of farms and the reduction in unit costs of production. Hence, the cost of food was reduced and consumers benefited. The most frequently cited evidence of these societal benefits was the declining proportion of real disposable income spent by the public for food.

The argument is clearly illustrated in figure 5. In the short run, some factors of production are fixed (cannot be immediately varied); thus, firm (plant) size is fixed. If a firm is of

¹² For additional analyses of how the amount of equity affects cash flow for several typical farming situations, see (19).

Table 19—Distribution of farms and agricultural product sales, by type, 1974

| Type of farm ¹ | Less than \$40,000 in sales | | | More than \$40,000 in sales | | | All farms | |
|---------------------------------------|--------------------------------|---------|---------------------------|--------------------------------|---------|---------------------------|-----------|------------------------|
| | Number | Percent | Percent of total sales | Number | Percent | Percent of total sales | Number | Total sales \$1,000 |
| Cash grain | 400,024 | 69.0 | 25.9 | 179,506 | 31.0 | 74.1 | 579,530 | 23,548,215 |
| Cotton | 18,848 | 68.6 | 14.4 | 8,622 | 31.4 | 85.6 | 27,470 | 1,724,981 |
| Horticultural | 7,130 | 62.5 | 8.0 | 4,286 | 37.5 | 92.0 | 11,416 | 1,165,140 |
| Livestock | 392,059 | 79.7 | 19.8 | 99,800 | 20.3 | 80.2 | 491,859 | 22,054,665 |
| Dairy | 116,777 | 60.2 | 27.8 | 77,084 | 39.8 | 72.2 | 193,861 | 9,623,312 |
| Poultry and eggs | 9,500 | 23.4 | 3.3 | 31,163 | 76.6 | 96.7 | 40,663 | 5,999,795 |
| Sugar, peanuts, potatoes ² | 43,626 | 66.8 | .9 | 21,641 | 33.2 | 99.1 | 65,267 | 5,185,796 |
| Tobacco | 74,796 | 89.5 | 55.8 | 8,762 | 10.5 | 44.2 | 83,558 | 1,528,268 |
| Vegetable and melon | 4,536 | 56.2 | 4.2 | 3,529 | 43.8 | 95.8 | 8,065 | 1,564,748 |
| Fruit and tree nut | 31,372 | 71.8 | 16.9 | 12,346 | 28.2 | 83.1 | 43,718 | 2,561,219 |
| General crop farms | 15,514 | 72.4 | 32.4 | 5,910 | 27.6 | 67.6 | 21,424 | 812,808 |
| General livestock farms | 2,147 | 59.1 | 24.8 | 1,487 | 40.9 | 75.2 | 3,634 | 168,656 |
| Total of above | 1,116,329 | 71.1 | 21.1 | 454,136 | 28.9 | 78.8 | 1,570,465 | 75,937,603 |

¹ Data not available, due to disclosure problems, for animal specialty farms and farms not otherwise classified.

² Includes hay and other field crop farms.

Table 20—Characteristics of cash grain and cotton farms with over \$40,000 in gross sales, 1974 averages

| Item | Wheat farms ¹ | Corn/soybean farms ¹ | Cotton farms ¹ |
|------------------------------|--------------------------|---------------------------------|---------------------------|
| <i>Number</i> | | | |
| Farms | 35,474 | 79,920 | 6,934 |
| <i>Acres</i> | | | |
| Land inventory: | | | |
| Acres operated | 1,728 | 565 | 1,254 |
| Cropland acres | 1,199 | 475 | 982 |
| Acres harvested | 802 | 431 | 801 |
| Cropland not harvested | 397 | 44 | 181 |
| Pasture, range, and woodland | 490 | 74 | 221 |
| Other land | 39 | 16 | 51 |
| Tenure: | | | |
| Acres owned and operated | 940 | 240 | 635 |
| Acres rented in | 839 | 337 | 696 |
| Acres rented out | 51 | 12 | 7 |
| Crop enterprises: | | | |
| Wheat | 650 | 40 | 38 |
| Corn | 40 | 213 | 4 |
| Soybeans | 15 | 148 | 109 |
| Other grains | 51 | 11 | 72 |
| Hay and fieldseeds | 52 | 16 | 34 |
| Other crops | 2 | 3 | 10 |
| Cotton | 0 | 0 | 509 |
| <i>Dollars</i> | | | |
| Value of sales: | | | |
| Grain | 77,414 | 74,630 | 30,806 |
| Fieldseeds and hay | 1,770 | 445 | 8,492 |
| Other field crops | 1,629 | 302 | 2,538 |
| Vegetables | — | 224 | 2,808 |
| Fruit | — | — | 900 |
| Other crops | 820 | 619 | 134,078 |
| Livestock | 10,090 | 11,865 | 3,488 |
| Total | 91,742 | 88,093 | 183,110 |

— = Insignificant amount.

¹ Farms in the following States: wheat—Kansas, North Dakota, Washington, Montana, Oklahoma; corn/soybeans—Illinois, Iowa, Nebraska, Indiana, Ohio; cotton—Texas, California, Arkansas, Arizona, Mississippi.

Source: 1974 Census of Agriculture.

Table 21—Financial characteristics of cash grain and cotton farms with over \$40,000 in gross sales, 1974 averages

| Item | Wheat farms | Corn/soybean farms | Cotton farms |
|--------------------------------|-------------|--------------------|--------------|
| <i>Dollars</i> | | | |
| Balance sheet: | | | |
| Assets | 318,310 | 255,158 | 433,180 |
| Debt | 37,609 | 30,555 | 71,907 |
| Equity | 280,701 | 224,603 | 361,273 |
| Percent equity | 88.2 | 88.0 | 83.4 |
| Current income: | | | |
| Gross receipts | 91,661 | 88,095 | 183,111 |
| Total expenses | 56,329 | 53,038 | 147,899 |
| Net income to equity | 35,332 | 35,057 | 35,212 |
| Other income: | | | |
| Net farm related | 1,278 | 2,759 | 3,289 |
| Nonfarm | 2,708 | 2,761 | 4,178 |
| Total | 3,986 | 5,520 | 7,467 |
| Total income: | | | |
| All sources | 39,318 | 40,577 | 42,679 |
| Farm sources | 36,610 | 37,816 | 38,501 |
| Real estate asset appreciation | 16,582 | 9,244 | -14,967 |
| <i>Percent</i> | | | |
| Returns to equity from: | | | |
| Annual farm income | 13.04 | 16.84 | 10.66 |
| Real capital gains | 5.91 | 4.12 | -4.14 |
| Total | 18.95 | 20.96 | 6.52 |

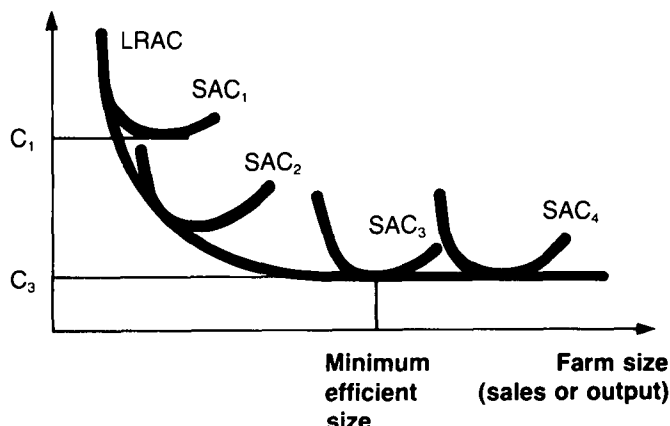
Source: Calculated from 1974 Census of Agriculture data.

Note: The financial characteristics were determined in the following manner: Gross receipts are equal to total market value of agricultural products sold. Total expenses were calculated by weighting the average variable costs for farms with gross sales of more than \$100,000 with those of farms having gross sales of \$40,000 to \$100,000. Wheat farms were those classified by the Census of Agriculture as cash grain farms in the predominantly wheat-growing States of Kansas, North Dakota, Washington, Montana and Oklahoma; corn/soybean farms were cash grain farms in the predominantly soybean/corn States of Illinois, Iowa, Nebraska, Indiana and Ohio; and cotton farms were listed as cotton farms in Texas, California, Arkansas, Arizona, and Mississippi. Total variable costs include cash rent, taxes, interest, depreciation, as well as the customary cash items. In addition, a management charge, representing 5 percent of total sales, and a labor charge calculated from crop production budgets were included. Returns to equity were calculated by taking the ratio of total income from farm sources to equity and the ratio of real estate asset appreciation to equity.

Figure 5

Economies of size

Cost per unit of output



the size represented by SAC_1 (shortrun average cost), the optimum operating point would be C_1 where unit cost is lowest. But over time, all factors can be varied and the firm could move to the optimum size; it would attempt to reach the size represented by SAC_3 , the optimum longrun firm size with unit costs (C_3) at a minimum. In a competitive economy, product prices would reflect the lower costs (and for agriculture, would ultimately be reflected in lower food prices). There would exist no further cost reduction incentive for a firm to grow beyond the least-cost size—any size growth beyond (say, to SAC_4) would also yield no benefits to society in terms of lower food costs.

Consumers have benefit significantly from the past efficiency gains in the farm sector; the tradeoff between farm numbers and food costs has been decidedly advantageous to consumers. But the question now arises (especially with arguments that the sector is in relative resource equilibrium, if for no other reason) as to whether, given existing technology and relative prices, further significant efficiency gains can be realized from continued consolidation of farms? Is this farm size and food price tradeoff still valid? Have the primary farms realized most of the attainable size economies (are they now operating at or to the right of the minimum on their longrun average cost curves)?

If it is assumed that the sector is in longrun equilibrium and technology is unchanged, there can be no efficiency gains from increasing farm size. However, if the longrun average cost curve is flat, the individual firm can increase its total profit by expanding in size even though there are no efficiency gains and no gains to society. It is important to note that changes in size in the past have not occurred with given technology but with rapidly changing technology. An important question is whether future technological change will continue to induce increased farm size.¹³

Again, any generalizations are severely limiting—each farm situation is different. Moreover, there are conceptual and empirical difficulties with determining size economies (how does one treat operator labor, land, and management costs, for example?), difficulties peculiar to agriculture. For the specific nature of these difficulties and their implications, see Miller (12).

However, current studies are reexamining technical economies of size, and qualified estimates of least-cost farm sizes for seven farming situations have been developed (table 22).¹⁴

These estimates bear out previous studies that show unit costs fall rapidly as farms grow from a very small size and the cost curve becomes relatively flat over a wide range in size; that is, most of the economies are attained at relatively small sizes. Capturing the relatively small remaining economies involves much further growth beyond the size where most economies can be attained (13).

There may, however, be significant market economies in the purchase of inputs and sale of outputs that can be achieved by further growth of the firm. It could also be suggested that, historically, it has been more common that economies of size have resulted in “functions” or “operations” breaking away from farming (such as marketing and processing of products), thereby resulting in technical size economies in these input supply and marketing functions rather than in the production of products. To the extent that these market economies result from real savings in the cost of providing such farm services, these market economies contribute to lower food costs for consumers. (Studies are underway to identify and evaluate these market economies.)

¹³ New technology will obviously keep changing the cost curves. One issue may be whether a new technology (such as a larger tractor) actually lowers costs of a large size farm or simply raises costs for smaller farms. Such a technology would provide incentive for growth but would not lower food costs.

¹⁴ Technical economies of size refer to those savings or efficiencies gained by utilizing resources more efficiently within the firm. They contrast with market economies resulting from large farms being able to negotiate higher prices for products sold and lower prices for inputs purchased.

Table 22—Least-cost farm sizes for various farming situations, 1979

| Region/farm type | Size at which 90 per- cent of economies are attained | | Size at which 100 per- cent of economies are attained | |
|--|--|--------------|---|--------------|
| | Sales | Area | Sales | Area |
| | <i>Dollars</i> | <i>Acres</i> | <i>Dollars</i> | <i>Acres</i> |
| Northern Plains/wheat-barley farm | 13,000 | 177 | 105,000 | 1,475 |
| Pacific Northwest/wheat-barley farm | 54,000 | 449 | 156,000 | 1,887 |
| Corn Belt/corn-soybean farm | 60,000 | 299 | 145,000 | 639 |
| Southern Plains/wheat-sorghum farm | 28,000 | 399 | 100,000 | 1,488 |
| Delta/cotton-soybean farm | 47,000 | 335 | 122,000 | 1,237 |
| Southern High Plains/cotton-sorghum farm | 58,000 | 395 | 175,000 | 974 |
| Southeast/peanut-soybean-corn farm | 55,000 | 143 | 130,000 | 399 |
| Average (arithmetic) of seven farms | 45,000 | 314 | 133,000 | 1,157 |

Source: Unpublished studies, U.S. Dept. Agr., Econ. and Stat. Serv.

How do the major commodity farms in the principal producing States compare on average with the least-cost sizes noted above? Again, the comparison is limited: the Census data are for 1974 while the seven farming situations are for 1979. But by adjusting the 1974 situations to 1979 dollars, we can gain some notion of the relative magnitudes. The comparisons in table 23 suggest that most primary farms are of a size where most of the technical economies can be attained.

Only four types of primary farms appear to have attained an average size exceeding the point where 100 percent of the technical economies can be attained: the Texas cotton farm (measured by acreage), the Arkansas and Mississippi cotton farms (measured by gross sales), and the Kansas wheat farm (measured by gross sales). Note, however, that averaging implies that many farms included in these averages exceed the size at which all technical economies can be attained.

Farm size-cost relationships become important when treating the unit cost of production of individual commodities, the basis for determining benefits for many of the present farm programs. The general relationship is that production cost per unit (bushel, bale, or hundredweight) declines as farm size increases, up to some point. It has also been suggested that farms specializing in production of a commodity in an adapted production region, and of the size noted above, would likely have unit costs well below the average costs of all farmers producing the commodity. That is, farms in the Wheat Belt specializing in wheat would likely have costs of producing a bushel of wheat well below those of producing a bushel of wheat on a corn farm in the Corn Belt; likewise, Corn Belt farms can produce a bushel of corn much more cheaply than can farms in the Southeast.

The unit cost is linked to the current farm programs through the target prices. These prices were initially established (and

are adjusted annually) in relation to national average cost of production of essentially all the acreage of the crops grown. Thus, high-cost producers and high-cost regions are factored into the average along with low-cost producers and low-cost production regions. To whatever extent the average cost and the resulting target price exceed the cost of the low-cost producers in the major producing areas, the target prices provide those producers with what is usually referred to as a windfall gain. Likewise, to the extent the high-cost producers and areas have costs that exceed the average and the resulting target prices, they will receive insufficient program benefits. The implications of this have been discussed elsewhere (15); the major impacts are the capitalization of the windfall benefits into capital assets, principally land. The rising land prices and farm consolidation have been two rather apparent manifestations. Less apparent is that, from society's point of view, such programs foster inefficient resource use, lower production, and higher costs by subsidizing inefficient producers and producing regions and by retarding reallocation of resources on a national basis.

The implications for policy arise from the use of national averages (whether cost of production, target prices, loan rates, or other measures) as income, price, or cost standards. The diversity of today's farms means that single values for use across the entire farm sector should be seriously questioned. Use of such values may impede the programs' efficiency and cause the distribution of benefits to become even more skewed.

Implications for Future Public Policy

This article began with a review of the longstanding farm problem and the policies that were used over the years to address it. That problem was seen to be an excess of resources devoted to food production—a stream of technologi-

Table 23—Comparison of average farms from census data with efficient sizes from studies of typical farms

| Type of primary farm | Average cropland 1974 census acres | Acreage to attain percent of economies— | |
|----------------------|--|--|-------|
| | | 100% | 95% |
| <i>Acres</i> | | | |
| Wheat farms: | | | |
| Kansas | 1,003 | 1,840 | 515 |
| North Dakota | 1,214 | 1,600 | 650 |
| Washington | 1,470 | 1,850 | 630 |
| Montana | 1,853 | 1,600 | 650 |
| Oklahoma | 868 | 1,840 | 515 |
| Corn/soybean farms: | | | |
| Illinois | 472 | 640 | 370 |
| Iowa | 401 | 640 | 370 |
| Nebraska | 638 | — | — |
| Indiana | 478 | 640 | 370 |
| Ohio | 464 | 640 | 370 |
| Cotton farms: | | | |
| Texas | 1,019 | 970 | 780 |
| California | 925 | — | — |
| Arizona | 890 | — | — |
| Arkansas | 823 | 1,180 | 1,020 |
| Mississippi | 1,078 | 1,180 | 1,020 |

| | Average gross sales 1974 | 1974 gross sales in 1979 dollars ¹ | Gross sales to attain percent of economies— | |
|---------------------|-----------------------------|---|--|---------|
| | | | 100% | 95% |
| <i>Dollars</i> | | | | |
| Wheat farms: | | | | |
| Kansas | 93,432 | 137,649 | 88,000 | 35,000 |
| North Dakota | 82,292 | 121,237 | 110,000 | 30,000 |
| Washington | 131,930 | 194,367 | 155,000 | 70,000 |
| Montana | 88,248 | 130,012 | 110,000 | 30,000 |
| Oklahoma | 80,945 | 119,253 | 88,000 | 35,000 |
| Corn/soybean farms: | | | | |
| Illinois | 90,904 | 133,925 | 145,000 | 80,000 |
| Iowa | 83,349 | 122,794 | 145,000 | 80,000 |
| Nebraska | 90,229 | 132,930 | — | — |
| Indiana | 91,796 | 135,239 | 145,000 | 80,000 |
| Ohio | 84,162 | 123,992 | 145,000 | 80,000 |
| Cotton farms: | | | | |
| Texas | 93,510 | 137,764 | 175,000 | 125,000 |
| California | 360,065 | 530,468 | — | — |
| Arizona | 306,015 | 450,839 | — | — |
| Arkansas | 124,310 | 183,141 | 115,000 | 115,000 |
| Mississippi | 172,771 | 254,536 | 115,000 | 115,000 |

— = Data not available for these States.

¹ The 1974 dollar sales estimates were inflated to 1979 dollars by the Consumer Price Index.

cal advances kept production capacity growing faster than the requirements of the domestic and foreign markets. The result was low commodity prices and farm incomes low in relation to incomes of the nonfarm population. Public programs to aid farm families were then instituted. The problem proved to be chronic as resources were slow to leave agriculture and the technological advancements permitted continued growth in production, even with fewer and fewer farmers. But since society benefited from the technological advancements, it supported continuing public expenditures for farm programs.

Over the years, labor resources migrated from agriculture at a varying pace and, at the same time, the domestic and foreign markets grew, gradually bringing the production potential and market requirements into closer accord. Sometime in the early seventies, most of the excess capacity was absorbed and a much more evenly balanced supply and demand situation was finally reached for the first time in over 50 years.

As we enter the eighties, the long period of adjustment to excess capacity and disequilibrium in U.S. agriculture appears to be finally behind us. The implications of that alone are significant enough to merit a major review of the policies, programs, and institutions that attended that period. But the factor that is in large part responsible for bringing the disequilibrium to an end—the growth in global demand for U.S. agricultural products—promises to continue with significant impacts on the market environment in the decade ahead.

The Prospective Agricultural Economy

The economic environment for domestic agriculture will probably be largely determined in the years ahead by global production and consumption developments, even more so than in the past few years. Increases in global food production in the eighties may come more slowly than in the past. Yet, global food demand seems likely to exhibit continued strong growth. A more complete use of the world's more productive and relatively accessible land will be required. World agricultural trade will continue to grow in importance, with continued growth in the demand for U.S. products as the rest of the world becomes increasingly dependent on the United States for food supplies. This could suggest a sharp contrast with the past; instead of real declines in commodity prices as in most of the postwar period, real commodity prices over most of the eighties may rise.

This relatively favorable outlook for domestic agriculture does not come without concerns. Fluctuations in production and consumption virtually anywhere in the world will be amplified in the demand for U.S. products, as the United States assumes an increasingly dominant role of world food supplier. Demand fluctuations for U.S. products tripled in the seventies; this variability could again double in the eighties.

Such potential instability in agricultural commodity markets promises to be a major concern.

As domestic agriculture becomes much more interdependent with the rest of the world, the characteristics of the farm sector are even more important in policy deliberations. Some of those characteristics, whose implications will form the focus of the farm bill debates are summarized below:

- The farms that comprise the sector today have widely diverse characteristics, especially size. Three rather distinct groups appear to have evolved: "rural farm residences," the very small places with sales of less than \$5,000 and constituting 44 percent of all farms; "small farms," with sales of \$5,000 to \$40,000 and constituting about 34 percent of all farms; and "primary farms," with at least \$40,000 in sales and constituting 22 percent of all farms. The contributions of these groups to total outputs is inverse to their proportions of total numbers, reflecting the large concentration of production today.
- The economic well-being of these groups, especially of the smaller two, has in recent years become more closely tied to the nonfarm economy than to the farm economy. Income from nonfarm sources surpasses by several times the income from farming for the two smaller sized groups. This advent of significant nonfarm earnings has markedly reduced the disparity of incomes among farm people and reduced the disparity in incomes between the farm and nonfarm sectors. The incomes of the small farm group, however, are a little less than the national median.
- The rates of return to investments in the farm sector have increased significantly over the past decade, both from current income and from capital gains but more rapidly for capital gains. Farm investment returns now appear to compare favorably with earnings on investments in the nonfarm economy.
- The inherent instability in agriculture was significantly increased in the seventies with the advent of rapid growth in export markets. This instability, ultimately reflected in farm earnings, most severely affects those farms most reliant on farm income—the primary and, to a lesser extent, the small farms; least affected are the residence farms.
- Subdividing the primary farms by type of principal commodity produced reveals that a surprisingly small number of farms accounts for the large proportion of production of each commodity.
- The financial structure of farms has changed radically from the fifties owing to the greater use of purchased production inputs and the growing use of debt capital. As a result, the annual cash requirements of most farms have greatly increased to the point where most farmers now

have large annual fixed financial obligations. The extent of their cash needs varies among farm sizes, being greater for farms of larger sizes, and most pronounced for the primary farms, whose debt-to-asset ratio and cash expense-to-production receipts ratio are much larger than for the smaller farms.

- The longrun average cost curve for farms declines rapidly as farm size increases, up to a point, and then becomes relatively flat over a wide range in size. Most of the primary farms have reached, or are significantly larger than, the size needed to attain most cost economies. The major portion of food and fiber is thus produced by firms that have achieved most technical efficiencies.

U.S. agriculture enters the eighties in a much different position than it was even a decade ago. Millions of modest-sized family farms, the initial object of farm assistance programs, are no longer there. The problems confronting the remaining farms are of a much changed nature from those that so long prevailed. Moreover, the future economic climate for agriculture may be far different from that to which we have grown accustomed. In combination, these two conditions suggest that old policy prescriptions are unlikely to be effective in the eighties. We will more likely be confronting problems with which we have little familiarity. It thus seems prudent that we now begin to draw up and assess more fully the implications of the likely new era. With 1981 being another major legislative year for food and agriculture, it is especially timely to explore their meaning for the development of future public policies.

Implications

Some of the implications of the foregoing material with relevance to upcoming legislative deliberations are suggested below.

- Smaller farms earn little income from farming. Thus, we cannot solve the poverty or low-income problem of smaller farms with commodity price policy or farm policies. The larger (primary) farms as a group appear to have competitive levels of income and returns.
- Yet, their competitive incomes and rates of return do not mean that the primary farm group has no problems. The changed financial structure of these farms implies that they are much more vulnerable to variability of incomes and returns. This is especially true for the most financially leveraged farmers, those with little equity who have gone into debt to acquire assets: generally the new

farmers. Such farmers would probably benefit from price stabilizing programs; and those programs would benefit not only the most heavily leveraged farms, but also the overall system by protecting the nonfarm economy from disruptive impacts. Also, we need to look into the possible structural impacts of instability and the resiliency of the food system to shocks.

- Failing to recognize the fundamental changes in agriculture will obscure identification of the real problems that now exist and thus impede the development of more appropriate new policy and program approaches. Most of the basic program instruments (or mechanisms) that are in use were developed specifically for treatment of the income problem. These mechanisms (price support loans, direct purchases, production controls, marketing quotas) are largely oriented to enhance commodity prices. They provide benefits based on the volume of production, implicitly skewing the distribution of benefits to the larger volume producers, much fewer in number than the smaller volume producers. And, they implicitly treat the farm sector as a homogeneous monolith through use of national averages for setting program parameters (loan rates, target prices, costs of production), implicitly favoring groups with costs of production below the national average. It is highly unlikely that future use of these instruments, without substantial modification, would prove effective (or cost efficient) in treating current and emerging problems.
- The success of the farm sector in providing food at an ever declining proportion of consumers' disposable income was largely possible through greater efficiency achieved in the main by farm consolidation, the growth in size to capture the existing technical economies. Results from recent studies indicate that the primary farms, as a group, have achieved or are beyond the size of least-cost operations. That is, the technical economies (and, one could conjecture, the market economies as well) have largely been realized with existing technology and price relationships. Thus, while individual farmers could increase their incomes, there would appear to be no major gains to be had by consumers from further consolidation and size growth within this group of farms.
- Evidence also suggests that public policies (tax, commodity, credit) interact to encourage growth in farm size. An issue is whether it is appropriate to have benefits skewed to large farms or whether public policies should be "neutralized" in terms of distribution of benefits by size.
- The rise in tenancy—separation of landownership from operation, owing largely to high land prices, which serve as a barrier to entry—also affects the distribution of pro-

gram benefits. It is widely agreed that most of past program benefits have largely been capitalized into the value of land to the benefit of landowners. If continued, such programs would prove to be of little benefit to the increasing number of farmers who rent most of the land they operate. Continuing increases in land prices can also be expected to attract nonfarm investors as competitors with farmers for available land.

- Further, to the extent that the intended benefits of farm programs get capitalized into asset values, the intended distribution of benefits is perhaps subverted. Therefore, preventing benefits from being capitalized into land and other asset values may be an increasingly important aspect of future policy development.
- Another emerging consideration is that we guard against resource use policy that encourages exploitation of land and water in the short run to the detriment of long-term productive capacity or environmental quality. The “equilibrium perspective” and prospects for increased demand in the eighties increase the urgency of this need. The interaction between commodity and conservation programs needs more attention, along with other conservation incentives, as a way of internalizing the private cost of using resources that otherwise are or would become costs borne by society at large.
- If real commodity prices do rise, they will provide incentives for greater production. Cropping will move onto more fragile lands and land already in crop production will be used more intensively (more fertilizers, pesticides). This could result in greater environmental degradation and the loss of future productive capacity. The intensity of these concerns will depend heavily on the factors which will affect pressure on the land base. The important point here is that these possible impacts be recognized.
- The vintage rationale for farm policy, the justifications often given for regulation of the industry and expenditure of tax dollars, is no longer strictly valid. But, this is not to say there is no longer any rationale or justification for public programs for agriculture. Rather, the rationale and justification for programs to treat the current major problem (stability) are quite different from those invoked for the traditional low-income problem. In fact, the rationale and justification are now perhaps even stronger and more broadly based.

Public policies for agriculture have usually followed rather than preceded events and changing economic circumstances.

This was perhaps not so critical when the course of events was on a trend path. Available evidence suggests that economic conditions may be diverging from the trend. If true, it would seem more important than ever that future policy anticipate economic conditions.

References

- (1) Bonnen, James T. “The Distribution of Benefits from Selected U.S. Farm Programs,” *Rural Poverty in the United States*. Washington, D.C.: President’s National Advisory Commission on Rural Poverty, May 1968, (chapter 26).
- (2) Committee for Economic Development. *An Adaptive Program for Agriculture*. New York, July 1962, p. 9.
- (3) Crecink, John C. *Families with Farm Income, Their Income, Income Distribution, and Income Sources*. U.S. Dept. Agr., Econ. and Stat. Serv., Nov. 1979.
- (4) Johnson, D. Gale. *Farm Commodity Programs: An Opportunity for Change*. Washington, D.C.: American Enterprise Institute, 1973.
- (5) Johnson, D. Gale. “Agricultural Policy for the 1980’s.” Speech to the Chase Econometrics Agricultural Outlook Seminar, Arlington, Va., Apr. 16, 1980.
- (6) Larson, Donald K. “Economic Class as a Measure of Farmer’s Welfare,” *American Journal of Agricultural Economics*. Vol. 57, No. 4, Nov. 1975, pp. 658-664.
- (7) Lee, John E., Jr. “A Framework for Food and Agricultural Policy in the 1980’s,” *Southern Journal of Agricultural Economics*. Vol. 12, No. 1, July 1980, pp. 1-10.
- (8) Lin, William, James Johnson, and Linda Calvin. *Farm Commodity Programs: Who Participates and Who Gets the Benefits*. U.S. Dept. Agr., Econ. and Stat. Serv., (forthcoming).
- (9) Martin, Lee. (ed.). *A Survey of Agricultural Economics Literature*, Vol. 1, *Traditional Fields of Agricultural Economics, 1940’s to 1970’s*. Policy for Commercial Agriculture, 1945-71. Minneapolis: University of Minnesota Press, 1977, p. 212.
- (10) Mayer, Leo. “Agriculture: Parity, Parity, Parity.” Library of Congress, Congressional Research Service, Brief IB77116, May 1980.

- (11) Melichar, Emanuel. "Capital Gains Versus Current Income in the Farming Sector." Paper presented at the American Agricultural Economics Association Annual Meeting, Washington State University, Aug. 1, 1979.
- (12) Miller, Thomas A. "Economies of Size, Structural Change, and the Impact of a Family Farm Policy." Paper presented at the Western Agricultural Economics Association Annual Meeting, Las Cruces, N. Mex., July 21-22, 1980.
- (13) Miller, Thomas A., Gordon E. Rodewald, and Robert G. McElroy. *Economies of Size in U.S. Field Crop Farming*. U.S. Dept. Agr., Econ. and Stat. Serv., (forthcoming).
- (14) Penn, J. B., and W. Herbert Brown. *Target Price and Loan Rate Concepts for Agricultural Commodities*. ERS-361. U.S. Dept. Agr., Econ. Res. Serv., Aug. 1976.
- (15) Penn, J. B., and W. T. Boehm. "Research Issues Re-emphasized by 1977 Food Policy Legislation," *Agricultural Economics Research*. Vol. 30, No. 1, Jan. 1978, pp. 1-14.
- (16) Penn, J. B., "Economic Developments in U.S. Agriculture During the 1970's." *Food and Agricultural Policy*. (D. Gale Johnson, ed.), Washington, D.C.: American Enterprise Institute, (forthcoming).
- (17) Schuh, G. Edward. "The New Macroeconomics of Agriculture," *American Journal of Agricultural Economics*. Vol. 58, No. 5, Dec. 1976, pp. 802-811.
- (18) Schultze, Charles L. *The Distribution of Farm Subsidies: Who Gets the Benefits*. Washington, D.C.: Brookings Institution, 1971.
- (19) U.S. Department of Agriculture. *Status of the Family Farm, Third Annual Report to the Congress*. Econ. and Stat. Serv., (forthcoming).